Legal regime of human activities in outer space law

Carlo Golda

ABSTRACT

Current developments in space activities increasingly involve the presence of humans on board of space crafts and, in the near future, on the Moon, on Mars, on board Space Stations, etc. With respect to these challenges, the political and legal issues connected to the status of astronauts are largely unclear and require a new doctrinal attention. In the same way, many legal and political questions remain open in the structure of future space crews: the need for international standards in the definition and training of astronauts, etc.; but, first of all, an international uniform legal definition of astronauts. Moreover, the legal structure for human life and operations in outer space can be a new and relevant paradigm for the definition of similar rules in all the situations and environments in which humans are involved in extreme frontiers. The present article starts from an overview on the existing legal and political definitions of "astronauts", moving to the search of a more useful definition. This is followed by an analysis of the concrete problems created by human space activities, and the legal and political responses to them (the need for a code of conduct; the structure of the crew and the existing rules in the U.S. and ex-U.S.S.R.; the new legal theories on the argument; the definition and structure of a code of conduct; the next legal problems in fields such as privacy law, communications law, business law, criminal law, etc.).

1. INTRODUCTION

Since 1961, which marked the onset of human space flights with Yuri Gagarin, and until today, no more than 200 individuals the world over can boast the title of astronaut. Almost all of these are either US or ex-Soviet citizens and most are career military officers[1]. On the other hand, a period of significant changes in human space flight has already begun. First of all the "Freedom" space station program (continuing, although behind schedule) will lead to the establishment of communities in space, on board special vehicles of a totally new type and, more importantly, of greater size[2].

Additionally, ten years of experience with the American S.T.S. (the Space Shuttle) have demonstrated that, although not without difficulty, it is possible to exploit extra-atmospheric space commercially for activities that require man's physical presence (scientific experiments, manufacture of special chemical and biomedical substances, satellite repair, etc.). Then one should consider that both cost and domestic/foreign policy issues have led to an increasing internationalization of activities in space, with the consequence of an increasingly varied and multifaceted composition of flight crews, both in the West and in the ex- communist countries.

Lastly, it should be underscored how an easier and, within limits, more "economical" access to extra-atmospheric space has motivated private organizations (led by the large multinational corporations) to gain access to space for a variety of motives, preferably with their own personnel included as crew members[3].

2. WHO IS AN ASTRONAUT

Consequently, the time has come for jurists to focus on man, the astronaut, in order to confront the mass of legal issues apparently generated by human space flight. This need, which is felt by Americans in particular, was recently addressed by international diplomacy by the COPUOS[4] legal sub-committee. On this issue, the situation today is still quite confused, so much so that not even a univocal legal definition

of the term "astronaut" has been agreed upon[5]. The international law sources, which in some way and for various ends recall the concept of "man operating in space", provide vastly different indications.

First of all, art. 5 of the Outer Space Treaty[6] as well as the tile and preamble of the Rescue Agreement[7] utilize the term "astronaut", art. 8 of the Outer Space Treaty utilizes the term "personnel", articles 1 and 4 of the Rescue Agreement refer to "crew", art. 12 of the Outer Space Treaty mentions "representative", articles 3 and 5 of the Liability Convention[8] mention "persons aboard a space object", and, finally, art. 5 of the Outer Space Treaty proposes the classical definition of "envoys of mankind".

2.1. Astronauts as "envoys of mankind"

First of all it is appropriate to discuss the validity of this latest definition that, repeated and used on several occasions in the political and diplomatic arenas, is apparently an expression of the most widely accepted classification of personnel operating in outer space[9]. In reality, and beyond its rhetorical value, the definition "envoys of mankind" is totally devoid of any juridical utility and today is obsolete, just as the Rescue Agreement itself[10]. This treaty, ratified in 1968, was the product of a world comprising only two space powers engaged in a cold war and involved in infrequent and very costly space activities. Therefore the Western and Communist blocks felt a need, including a military one, for reciprocal reassurance that any men and equipment that might fall into "enemy" hands would be returned[11].

In essence the intent was to guarantee a sort of diplomatic immunity to the astronauts (the boundaries of which were all but well defined), sanctioned by the foremost supranational authority in light of the benefits, indeed international, that derive from human activities in space and in light of the risks that crews voluntarily agree to take. The dissolution of the communist empire, on one hand, and the extreme ambiguity of the cited definition, on the other hand, compel us to reject it in the context of this paper, even though the Rescue Agreement has been ratified by more than 80 countries. If anything, the latter datum can assist in directing the hermeneutic research of the emerging principles of international public law in the matter of research and rescue during space activities.

2.2. Astronauts as "persons on board a space object"

If we examine all of the previously cited definitions, the most juridically useful one is apparently that of astronauts as "group of persons on board a space object[12]". This definition must be accepted as the one least likely to be criticized since it is directly traceable to the principles of navigation law of the Scialoja School. If indeed all human activities in extra-atmospheric space must take place within a truly autarkic vehicle and if every role or function of man in space can in all cases be traced to the supporting vehicle and its navigation, then the above mentioned definition seems the most fitting because it makes it possible to use (and quote) all the doctrinal and normative efforts devoted so far to similar cases in maritime law, including ancient and aeronautical law. Furthermore, it is also necessary to point out that the proposed definition is independent of the substantial and diverse activities that can be conducted in space (piloting, experiments, etc.) as well as of the duration of space flights, the composition of the crew, etc. Obviously, E.V.A.[13] (i.e. space walks) must be included within the expression "on board...". It cannot be ruled out that, in the near future, the definition of choice will become inadequate to cover the spectrum of human extraterrestrial activities. In particular it may become necessary to distinguish between astronauts and the normal passengers of extra-atmospheric flights. However we can affirm that such a distinction would effect certain aspects of international private law (in the areas of trade, compensation, etc.) more than international public law and that, as of today, a development of such magnitude cannot be anticipated. More important is the issue concerning human settlements on the surface of other planets[14].

Obviously, the definition proposed must be integrated to include persons who, already members of a crew

of astronauts, would then remain on a celestial body, whether or not becoming separated from the rest of the crew[15]. In this respect the definition contained in the Moon Treaty (the last of the space-related treaties) could be used. Art. 10 of this treaty defines astronauts as "any person on the Moon.....". This concept integrates perfectly with that of "person on board a space object" as the first expresses the static phase while the second expresses the dynamic phase of human activities in space. Furthermore, this definition does not exclude the preceding one and allows both concepts to apply at the same time, referring each time either to one or the other, depending on the juridical nature and the characteristics of the problems to be confronted.

2.3. Current situation with international norms

Moving on to review the current regulatory evolution of the issue of the juridical qualification of astronauts, it is necessary to note that two documents have already been presented to the U.N. in 1987 (more precisely the C.O.P.U.O.S. Subcommittee), both of which concern the matter under scrutiny. The first document regards accidents and critical situations in space flight, the other the legal status of the crew and rescue operations. The first is the working document (No. A/AC-105/C-2/L 159 dated 27/3/87) presented by the United Kingdom to promote the broadening of international cooperation in the event of an accident or critical situation on board an inhabited space station. The second working document (No. A/AC-105/C-2L 161 dated 1/4/87) was presented by Czechoslovakia to bring the issue of the juridical status of the crew of a space object and the matter of rescue operations of such a crew to the attention of the COPUOS juridical subcommittee[16].

3. THE SPECIFIC PROBLEMS POSED BY HUMAN ACTIVITY IN SPACE

Having exhausted the discussion on the general picture of international public law concerning the actual definition of "astronaut", it becomes necessary to investigate the specific problems posed by the expansion of human activities in space. The debate over the definition can be actually circumvented by a homogeneous juridical discipline under various profiles of law (private, penal, etc.) capable of leading to an "a posteriori" definition of the astronaut concept. Given the vastness of the issues before us, it is helpful to identify some of the specific questions that will and, at least in part, already face us.

3.1. The Code of Conduct

It seems that the issue of a "Code of Conduct" for astronauts is the most urgent one, also given the premises. Actually, strong internationalization of space activities will increasingly involve the selection of heterogeneous crews impossible to govern by applying specific national laws or the usual conflict norms of international private law[17].

3.1.1 The crew's roles

Prior to a discussion on the "code of conduct" there is the question of the definition of the roles of the individual crew members of a spacecraft. In fact, the roles of the individual astronauts constitute a technical and juridical framework for the ensuing behavioral norms, as the latter must necessarily blend in with the technical role entrusted to each astronaut. The order of the stated ideas is then confirmed in practice by today's activities in space. Both the US and the ex-USSR have indeed devised international norms (at times involving simple administrative acts) in order to differentiate between the various roles, functions and authorities among the crews. The definition contained in the NASA documents is particularly useful and clear[18]. Within a crew, the American Space Agency identifies the roles of captain, pilot, mission specialist and payload specialist[19].

- - The *Captain* on board is a NASA career astronaut. During the flight he is entrusted with the absolute power to order all actions that he deems necessary to ensure discipline and the safety of the spacecraft and the astronauts. To achieve this end the captain may avail himself of all means at his

disposal, including physical coercion. The captain's authority extends over all persons on board, regardless of their nationality, and also includes transferees from other vehicles, even only temporary ones, including personnel involved in Extra Vehicular Activities. In addition, in the event of a descent on a celestial body, the captain assumes all duties of the leader of the landing party, regardless of whether or not he is concretely involved in the activities on the surface of the celestial body.

- - The *Pilot* is also a career astronaut and his duties are of an exquisitely technical nature (even though he remains under the authority of the captain even as far as piloting the spacecraft is concerned). Most important is the role of Second in Command that the pilot assumes every time the captain is otherwise occupied and/or prevented from carrying out his duties.

- - The *Mission Specialist* is equally a "professional" astronaut deeply involved with achieving the results of the individual mission. Consequently, the mission specialist is involved in planning the mission and is responsible for coordinating the use of the spacecraft and the payload.

- - The *Payload Specialist* is the only crew member who is not necessarily a career astronaut. He generally is not part of the flight crew (and may be a national of a country other than the US) and can even come from the private sector (industry, universities, etc.), rather than space agencies[20]. The payload specialist does not take part in any extra-vehicular activity and his duties are limited to activating all of the instruments that pertain to the payload as well as obtaining the scientific and experimental results for which the latter was planned.

3.1.2. New doctrinal tendencies in defining crew roles

In light of the fact that flight crews in the ex-USSR are structured in a similar way, it is immediately apparent that crews have been designed on the basis of a limited number of members with a tendentially homogeneous level of training. The future of space colonization, on the other hand, will carry with it the need for increasingly large crews (communities) with various backgrounds (physicians, scientists, etc.) whose level of preparedness for permanence in space may not be homogeneous and in any case whose level of inner conflict (due to ethnic, religious, personality or other reasons) could be higher. However, for the most part it will be impossible for the captain to exercise his authority in person and the chain of command will necessarily involve some degree of subdivision to administer particularly vast and complex vehicles.

Over the last few years, the best doctrine, American in particular, has raised the issue of delegating the powers of the captain and, consequently, of the different organization of the crew, focussing in particular on the differences between the S.T.S. and the Space Station[21]. The most significant and original fruit of this speculation has been the statement of two possible approaches to the problem: the "Spacecraft Commander Approach" and the "Delegation Approach"[22]. In essence, this latter approach stems from the premise that it is impossible, on the part of the captain, to personally manage the life of the vehicle and crew, and, as a solution, proposes the creation of Personnel Specialists. These would be individuals assigned to the Space Station for a certain period of time where they would carry out the tasks delegated to them by the captain to ensure order and discipline, provide for the safety and the well-being of the personnel on board, solve controversies within the crew and protect crew members and equipment on board the Space Station. Their curriculum must include training in psychology, law, public relations, medicine, etc., however without excessive specialization and they may also be other than NASA career astronauts and have only part-time duties on board. The proponents of this theory cite an historical precedent for this role identified as the "consul" figure in the "Codice Amalfitano" (Amalfi Code) a person who, on board, acted as a judge to quell disputes among the crew members[23]. The captain would maintain the "ultimate responsibility" in governing the vehicle as well as for the order, safety, well-being and integrity of the spacecraft and its passengers. Finally, the captain would maintain the right to

order the use of force, however with the possibility of delegating such use to one or more Personnel Specialists.

Although the approach illustrated briefly above is certainly original and presents some valid items, we feel that it is unacceptable despite being supported authoritatively and diffusely in American doctrine. Indeed, the creation of a figure such as the Personnel Specialist presents a number of uncertainties. First of all there is the fact that the captain is deprived of certain control and intervention faculties (for the most part typical of military command) on the life of his crew, with the substantial risk that he may be increasingly perceived as detached from the live of his crew members, more a controller than a chief. Furthermore, at the juridical level the captain would retain the ultimate responsibility for decisions made by others, the curriculum and abilities of whom he could not directly ascertain in numbers that may be substantial enough to create a real and true counterpower, especially on board large and very large spacecraft. This would actually pose a great threat to order, discipline and safety on board. We fail to understand, in the event of errors or abuse on the part of Personnel Specialists, how the captain could be called to answer in person, especially in the more serious cases, without artificially creating a sort of objective responsibility against him, totally incompatible with the subtlety and difficulty of his duties[24]. Having ruled out that they would only be American citizens (if nothing else for obvious political reasons), it is clear that personnel specialists could not belong to a single, well-defined, ethnic or religious group, least they lose their credibility in front of the other crew members with a different origin and culture. It is unrealistic today to imagine the existence of such individuals.

Finally, and still at the juridical level, the supporters of this theory have failed to explain where Personnel Specialists should be placed in the chain of command on board of the spacecraft, whether under normal circumstances or during emergencies. In particular, there is a risk that these individuals, somehow authorized to supervise and refer on the psychic health of the crew, could constitute a sort of internal lobby and dispose of the power to influence and to move accusations against any individual that is totally disproportionate and incompatible with any guarantee of the astronaut's freedom. Furthermore, in the event of an emergency, it is unclear whether they would be the immediate subordinates of the captain or of the second in command/pilot, or if they would indeed maintain an independent capacity to intervene. In this case, the proposed model would seem to lead to a "community" management of life on board that would be particularly harmful to the efficiency of the vehicle and unfit for space activities, at least those that can be hypothesized today[25].

The "Spacecraft Commander Approach" is substantially different. Based on a more traditional paramilitary model of the crew (as illustrated above) and supported by current international (art. 8 of the Outer Space Treaty) and national (US) regulations (42 U.S.C. par. 2473, first section of the US Code) this model contemplates the total subordination of each crew member to the captain, without any regard to individual roles or nationality[26]. In the case of non-American astronauts,these would in any case be subject to both American law and the laws of the countries they are nationals of, on the basis of diplomatic agreements made on a case by case basis[27]. Obviously, hierarchic subordination becomes even more rigid in the case of a military crew and it is precisely to the military origins of NASA personnel (at least during the Sixties) that supporters of the delegation of powers doctrine refer to prove the outdatedness of the approach just illustrated. In particular, the most valid criticism is based on the captain's physical impossibility of supervising every function "without becoming a space bureaucrat" on one hand and without creating command vacuums on the other. In effect, this objection is well taken where it states that "the Spacecraft Commander Approach" could be beneficial for small traveling communities, for a limited amount of time, formed by homogeneous members (the Shuttle is a typical example), whereas it would be inadequate for larger communities. Actually, we believe that the latter approach is absolutely preferable for a variety of reasons. First of all, it has strong foundations in historical maritime and aeronautical law. Whether military or civilian, the hierarchical distribution of roles on board "autarkic sailing vehicles" has always postulated the existence of a sole person responsible

for the life of the vehicle as well as the crew, with the consequent attribution to the same of at times limitless powers. Moreover, selection of this model makes it possible to fully exploit all of the doctrinal and jurisprudential developments that have occurred to date in the field of maritime law, and in uniform international norms in particular, which, in this field, are considerably vast, especially at the level of general principles. Then, the problem of the captain's actual ability to carry out all of the functions assigned to him and the problem of the risk of abuse, facilitated by the magnitude of the powers assigned to the him, can be solved without recourse to delegation of power within the crew (as would occur by establishing Personnel Specialists) by delegating said powers outside the crew.

In essence, it would be necessary to establish a regime by virtue of which the captain, at least during non-emergency situations on board, would be subjected to higher Ground Control Authorities, on the basis of the suggestions or, if necessary, orders of which he would act to regulate life on board. Such a system was effectively tested in the past through the "aeronautical director", and the commercial flight management system in particular, where most decisions concerning non-emergency flight are made by ground controllers and, for the most part, even the captain's decisions on board are made on the basis of precise and extremely detailed operations manuals that contemplate practically all possible flight situations. A similar system can be hypothesized for the relationship between Ground Control Authorities and the captain of a spacecraft, with the additional advantage that such a vehicle could be managed entirely through automatic and radio controls from earth, making it possible to exclude the captain should he no longer prove sufficiently reliable.

At the political level of international law, such a command chain would be the most favorably accepted by all Countries involved in an international mission, as it would allow for true international control over the life of the vehicle and its crew and, more importantly, it would situate the discussion and decisions involving the primary theoretical and juridical issues well before the beginning of the mission.

3.1.3. Concrete definition and structure of a Code of Conduct

Having exhausted the review of hierarchy within the crew it is possible to analyze the issue of a "code of conduct". Even today this regulation of the astronauts' life is already a problem that will become a most impelling one in the near future[28]. In fact, crew internationalization, their increasingly varied composition and the size of the vehicles and duration of permanence in space will increasingly configure human activities there as those of a traveling community, in part isolated, and on an almost totally autarkic vehicle. In this framework, the code of conduct must become a sort of international "general law" for all human activities in space, containing reference norms that, perhaps modified on a case by case basis, can guarantee a real and true legal regime of astronaut life.

With reference to the most recent doctrinal elaborations (I.S.U. 91), we can very briefly state that the code of conduct should be inspired by current international law on the matter of space activities and by the new requirements that will surface as space stations are commissioned and lengthy interplanetary voyages are undertaken. Therefore it will probably have to avoid norms of substantial and procedural penal law, since this branch of the law is the strict domain of individual countries (this would also hasten the acceptance of the Code of Conduct by the various Governments involved in space activities)[29]. The main issues that the code of conduct should regulate are the jurisdiction and definition of the roles and positions on board the spacecraft. Then, at the formal level, the code of conduct should be assembled as a series of uniform international law norms, whenever possible avoiding conflicting norms that would be difficult to apply, either diplomatically or juridically[30].

As far as jurisdiction is concerned, suffice it to state that, beyond applicable conventions[31], jurisdiction for a violation of the norms of the code of conduct should be maintained by the country of origin of the

perpetrator of the violation (in case of crimes requiring complete penal proceedings for an evaluation, after return of the astronaut to his country of origin), while so-called "simple insubordination" may be disciplined directly by the captain of the spacecraft. As far as the different roles on board the spacecraft and the related chain of command are concerned, with reference to earlier statements, the division of roles among Captain, Pilot (and First Officer), Mission Specialist and Payload Specialist are acceptable. In particular, the duties and powers of the captain should be defined as follows:

The captain is the highest ranking authority on board and/or on the surface of a planet. His powers include that of using or ordering the use of physical force against crew members, but only in case of an immediate and absolute necessity, to guarantee the safety of the vehicle[32]. The captain may consult with his first officer or all of the crew as far life on board is concerned and must in any case consult with the first officer before administering punishments and taking steps against any member of the crew.Emergency situations are those in which there is an immediate and obvious risk of damage or destruction of the spacecraft or its equipment, as well as those in which the physical health of the crew is even simply at risk.

3.1.4. New juridical problems

Beyond the structure of the code, as examined above, there are issues of substantial law concerning the life and activities of the astronauts. For the sake of this discussion it is necessary to propose a particular definition of astronaut, capable of distinguishing the latter from a possible passenger of space flights, to underscore the technical and juridical peculiarities of space work, separate from the contractual relationship of mere transportation which, in the future, could be the setting of the juridical positions of passengers. In this sense, accepting the recommendations of the best international doctrine[33], a "crew" is defined as "persons conducting professional activities during a space flight". Having clarified this issue, let us now identify the areas of the most urgent intervention.

First of all, at the civil law level there are personal rights[34]. With reference to the situation on earth, the astronaut lives and works in an environment the limited space and continuing forced cohabitation of which emphasize the need of ensuring some form of *privacy*[35]. The right to *privacy*, one of the issues that has developed the most in the field of personal rights over the last few years, is yet to be established in terms of extra-atmospheric activities. It implies the possibility for astronauts to practice their religion, to take their personal objects with them, to organize and use their own "personal" space within the spacecraft, to have the freedom to organize, albeit minimally, their work and rest schedules. Within the privacy sphere there is the issue of communications and information, with features that are markedly different from earth.

Astronauts must be guaranteed a possibility to communicate individually with Earth, whether with the ground control structures (GCA, etc.) or their families and employers as well as the reciprocal right to receive all the information that they may wish to receive, at least in the family and personal safety areas. Then, in particular, it will be necessary to reach a compromise between the possibility for the individual to use private radio frequencies (even if at given time intervals) and the need for the entire life of the space vehicles to be under control and also in order to ensure military and scientific secrecy. Another privacy issue is the limits to investigations of the life of men in space (both physically and psychically) and to the transmission of news concerning any individual on the part of other crew members[36].

Other pressing issues surface in the sphere of work and welfare law. There is definite proof that, in the absence of gravity, the human body experiences physical damage of significant entity (lack of calcium in the bones, cardiocirculatory problems, alteration of reflexes, etc.). This damage cannot be prevented beyond a certain limit and implies the right of astronauts to a special safeguard, both medical and

compensatory. Moreover, internationalization of crews in the current situation where each country provides individually for recruiting and training personnel (at times with differences between military and civilian personnel) creates an astronaut coverage problem. Therefore it will be necessary to establish homogeneous standards for recruiting, qualifying, training and determining the attitude for flight and lengthy sojourns in space, granting licenses and professional certification in this field.

Still in the astronautical field, but with implications that involve all the other fields of law, there is the problem of the right to safety. This right will have to constitute the basis of every juridical elaboration concerning the legal regime of astronauts and extend to all processes involving transportation, sojourn in space, scientific experiments, handling of dangerous substances, definition of parameters for clothing (intra and extra-vehicular), etc. Once again, special attention must be paid to radio communications in order to ensure the use of protected emergency frequencies (along the lines of existing aviation law)[37]. Then it will be necessary to provide a safeguard of the intellectual property rights that derive from human scientific activities in space in order to protect and encourage investments on the part of private companies and individual countries in this area, on one hand, and to insure the exploitation and dignity of the work of the men on the other. These men, individually, accept the risks and discomfort without which similar scientific experiments could not take place[38].

Finally, in the perspective of astronauts from many different backgrounds (national and international space agencies, military, commercial enterprises, research institutes, etc.) it will be necessary to guarantee uniformness of economical treatment in the wider sense of the term, establishing a single or very homogeneous labor contract (at least for extended flights), that could possibly be included in the code of conduct[39]. From the perspective of civil liability of the astronaut it will be necessary to provide a transfer mechanism of the individual astronauts' liability and, secondly, the liability of the countries of which they are nationals. This would ensure a sort of "immunity" to the astronaut that could compensate the hardship, including physical hardship, in which they work, and at the same time avoid depriving the subject who has suffered a loss of an equitable reimbursement for the damages sustained. At the penal level it will be necessary to deeply rethink the limits of guilt with regard to the astronauts' new and special living conditions. In particular it will be necessary to establish precise limits to the extension of criminal behavior to include a greater number of "involuntary" actions that could be perpetrated in space[40].

A different approach must be adopted for concepts such as total, partial and mental infirmity. Finally, for behavior defined as "simple insubordination", it will be necessary to establish a sanctioning system capable of ensuring respect of the norms on the part of the individual astronauts, also out of fear of punishment, but without involving sanctions that would deprive the crew of the contribution of the single members whose role is often technically irreplaceable. These sanctions must therefore be essentially economic in nature and/or effect the professional career perspectives of the astronaut[41].

4. REFERENCES

1 The record for the longest time in space belongs to the Russian L. Kizine with 375 days, 16 hours and 19 minutes of space flight.

2 See A. Farand "La Station Spatiale et son regime juridique", Min. des Aff. Ext. - Dir. Gen. des Aff. Jurid. Ottawa, 1989; Anajiom, Goldman, Meeks Space and Society: Challanges and Choices, Am. Astronautical Soc, Publ., 1984.

3 See I.S.U. "International Mars Mission Design Project", Toulouse, 1991, pp. 32 et seq. where the initial theoretical basis for the creation of an international organization dedicated to future space activities was laid. Young A.J., "Law and Policy in the Sp. St. Era", Utrecht, 1989, M. Nijhoff Pub., pp. 98 et seq., where the profile of space activity internationalization and privatization, although partial, is examined in greater depth.

4 C.O.P.U.O.S. Committee for the Peaceful Use of Outer Space, a permanent UN Committee established in 1959 by Resolution 1472 (14) adopted on 12/12/59 "International Cooperation in the Peaceful Use of Outer Space", by the UN General Assembly

5 Among the various authors who have addressed this problem, see: G. LAFFERANDERIE, "Pour une charte de l'Astronaute", Annual of air and Space Law, vol. XII, 1987, pp. 263 et seq., McGill Univ., Montreal; K.H. BOCKSTIEGEL, "Draft for a convention on Manned Space Flight", in ZLW 40. Jg. 1/1991, pp. 5 et seq.; Goldman, "International Space Law 1957-1979", Part II, pp. 74 et seq.

6 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies (the Outer Space Treaty, 1967).

7 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (the Rescue Agreement, 1968).

8 Convention on International Liability for Damage Caused by Space Objects (The Liability Convention, 1973).

9 See the Outer Space Treaty, art. 5: "States Parties to the Treaty shall regard astronauts as envoys of mankind in outer space...."

10 See Goldman, cit. p. 76

11 This is the framework in which some of the COPUOS member nations signed the Agreement, however reserving the right of granting political asilum to foreign astronauts that were to make such a request.

12 See in this respect: N.M MATTE, "Space Activities and Emerging International Law", Centre for Research of Air & Space Law, McGill Univ., Montreal 1986; SZALSO, "Air Crew and Space Crew - A modest Analysis of Analogies from Air and Space-law rules", document presented at the seminar of the International Institute of Space Law, Oct. 9-15, 1983, Budapest; DE SAUSSURE, Astronauts and Seamen - A legal Comparison, 10, J. Of Space L. 165 (1982); and others.

13 E.V.A. = Extra Vehicular Activities: all activities performed by the astronauts outside the spacecraft (i.e. walking in space or on celestial bodies).

14 International consensus is increasing on the "Agreement Governing teh Activities of States on the Moon and Other Celestial Bodies" (The Moon Treaty, 1979) containing the general principles that pertain to human extraterrestrial settlements, in accord with the Outer Space Treaty.

15 In this sense also I.S.U., cit., p. 48.

16 As of today, none of these documents has been developed. The en d of the cold war and of the resulting political bipolarism should allow for both of these diplomatic proposals to be resurrected.

17 See, in this respect, I.S.U. cit., p. 49; LAFFERANDERIE, cit., p 271 et seq.; FARAND, cit., p 13 et seq.; BOCKSTIEGEL, cit., p 5 and 6.

18 Presidential Executive Order 1977 establishing the Space Shuttle Program; U.S. Code of Federal Regulations, Title 14 - Chapter V - N.A.S.A. - part. 12/4; N.A.S.A. - NMI 7100-8-1987.

19 See S.F. MARCHI., "Authority of the Space Station Commander: the need for delegation", in Glendale Law Review, Vol. 6, n. 1, 1984, Glendale Univ., page 73 et seq.; LAFFERANDERIE, cit., pp. 270-271; I.S.U., cit., p. 50 et seq.

20 For example, the first Italian astronaut, Franco Malerba, is an engineer, not a pilot, employed by a private industry.

21 S.T.S. = Space Transportation System: official name of the "Shuttle". (Presidential Executive Order 1977 establishing the Space Shuttle program; US Code of Federal Regulations, Title 14 - Chapter V - NASA - part. 12/4; NASA - NMI 7100-8-1987); Space Station = "Freedom" Space Station: an orbital structure under development by the US, the European Countries (through ESA) and Japan, with the aim of creating a large permanently inhabited settlement in earth orbit.

22 See MARCH, cit., p. 74; I.S.U., cit., p. 48; FARAND, cit., p 18-21, etc.

23 The Amalfi Tables contain an ancient Mediterranean Code, dated 1131; see GILMORE & BLACK, The Law of Admiralty (2nd Ed., 1975) p. 5 note 14.

24 Among others, ROBINSON, "NASA's Space Station and the Need for Quantifiable Components of a Responsive Legal Regime", 6 Int'l Law 292, 297-300 (1972) discussing the risk factors of human relations within a space crew; NOTE, "Dispute resolution in Space", 7 Hastings Int'l & Comp. L. Rev. (1984).

25 This is the sense behind the criticism of the "Delegation Approach", es. in I.S.U., cit., p. 50.

26 For a complete definition and analysis of the Sp. Comm. App. see: GORONE, "The Sp. Shuttle: Some of its features and legal implication", 6 Annuals of Air & Space Law 381, 389-90 (1981); MOSSINGHOFF and SLOUP, "Legal Issues Inherent in Sp. Shuttle Operation", 6 J. Space L. 47, 67 (1978).

27 Although regarding other juridical issues, this hypothesis was already contemplated for the Shuttle flights by MOSSINGHOFF, "The Space Shuttle era: International and Domestic Legal Aspects", 72 Proceedings of the Am. Soc. Int. Law 249, 257- 58 (1981). 28 The issue of a "Code of Conduct" for astronauts for years has been at the center of the best doctrine. For example, see I.S.U., cit., p. 48 et seq.; YOUNG, cit., p 135 et seq.; BOCKSTIEGEL, cit., p. 6; Maj. Gen. T.B. BRUTON, USAF Judge Advocate General, "The status of Criminal Jurisdiction in Outer space", within the Proceedings of the 24th Conference of the Inter-American Bar Ass. Panama, February 1984 (no page no.), etc.

29 This is the direction in which international doctrine appear to be moving, especially until the end of political bipolarism, given the considerable differences that exist in the definition of crime and sentencing between communist and non- communist regimes.

30 See I.S.U., cit., p. 35 et seq.; YOUNG, cit., p. 67 et seq.

31 Art. 8 of the Outer Space Treaty

32 See, in this respect, YOUNG, cit., p 152-53, MATTE, cit., pp 342 et seq.

33 See, in this respect, YOUNG, cit., p 152-53, MATTE, cit., pp 342 et seq

34 In particular, LAFFERRANDERIE, cit., p 269 et seq.; BOCKSTEGEL, cit., p 6

35 See I.S.U., cit., p 115 et seq.

36 See P. SMITH, "Space Stations Intended Law and Policy", 312-61 (1979).

37 Even during a past Apollo mission there occurred problems with interference, loss of radio contact, etc., that ceased after the use of the "Hot Line" between Washington and Moscow (See LAFFERANDERIE, cit., p. 272).

38 See YOUNG, cit., pp. 164 et seq.; HOOVER, "Law and Security in Outer Space from the Viewpoint of Private Industry", 11 J. Space L. 115, 122 (1983); B. LUZENBERG & G.J. MOSSINGHOFF, "Intellectual Property and Space Activities", 13 J. Space L. 8, 13 (1985); see also on the issue of discovery and patent rights, among others T.M. FOLEY, "U.S. Proposal would restrict European, Japanese Station use", in Aviation Week & Space Technology, 16/2/87, p. 23; and R. OÖSTERLINK, "Les inventions de l-Agence et leur protection", ESA Bulletin n. 27, Aug. 81, pp. 22-26.

39 FARAND, cit., pp. 23 et seq.; YOUNG, cit., pp. 146 et seq.; MATTE N.M., "Aerospace Law From Scientific Exploration to Commercial Utilization", (1977, The Carswell Co. Ltd.) pp 162- 163, (note 24).

40 See BLUTH, "Consciuosness Alteration in Space", Paper presented at the Fourth Princeton/Am inst. of Aeronautics and Astronautics (AIAA) Conference on Space Maifacturing Facilities, Princeton, N.J. 14-17/5/79; AKINS, "Psychological and Psychophisiological Effects on Long Duration Space Flight", in Update on Space 64-81 (Bluth & McNeal ed., 1981).

41 This is the direction apparently taken by the US in applying art. 8 of the Outer Space Treaty, reference to which is made by 2 sections of the US Code (42 U.S.C. 2473); 18 U.S.C. 799); in any case see McDOUGAL, LARSWELL, VLASIS "Law and Public Order in Space", 1973, pp. 668-74.