Criminal Issues in International Space Law

Michael Chatzipanagiotis[*]

Abstract

This paper attempts to outline the rules and principles of international space law governing criminal activity in outer space or on board a space object. The relevant issues concern mainly the exercise of criminal jurisdiction, including extradition, and the disciplinary authority on board a space object. First, we examine the pertinent rules of general international law. Then, we analyse the applicable provisions of general space law, namely the Outer Space Treaty and the Moon Agreement, as well as the special rules on the International Space Station. Subsequently, we attempt to propose solutions to the main future challenges in international space law, which regard criminal behaviour on board aerospace vehicles, aboard private space stations, and issues regarding interplanetary missions and human settlements on celestial bodies.

Keywords: space law, criminal law, international law, jurisdiction, space exploration.

A person's behaviour is considered criminal, when it violates rules considered essential for harmonious human relationships. Therefore, wherever there is human activity, there is the potential for a crime to be committed. Space activities are no exception.[1]

Criminal issues in international law space law regard mainly jurisdiction over crimes committed in outer space or aboard a space object and command authority.

A General International Law

Since international space law is part of general international law, we should first examine some core provisions of the latter.

I Criminal Jurisdiction

The problem of criminal jurisdiction in international law focuses on the general principles according to which municipal courts may exercise jurisdiction over criminal offences in cases involving foreign elements.

* Attorney-at-law, Athens, Greece; Adjunct Professor, European University of Cyprus, Law School, Nicosia, Cyprus.

1 *See* J. Hermida, 'Crimes in Space', *in Annals of* Air and Space Law, Vol. XXXI, 2006, pp. 3-4, 9-17, who analyses also criminological aspects of criminal behaviour in outer space.

doi: 10.5553/EJLR/138723702016018001007

Criminal jurisdiction is determined mostly by national law, which often lacks uniformity. Moreover, there are special rules in international conventions attributing criminal jurisdiction for specific offences. As a result, certain distinct bases of international criminal jurisdiction (theories) have been formed, which have received different degrees of support from practice and opinion.[2]

1 *The Territoriality Principle*

According to the principle of territoriality, the courts of the state where the crime has been committed may exercise jurisdiction.[3] Closely connected to that principle is the quasi-territoriality or flag principle, according to which a state may exercise criminal jurisdiction over crimes committed on board ships, aircraft or space objects bearing its nationality ('flying its flag').[4]

The territoriality principle has been implemented to also cover crimes, the constituent elements of which have occurred only partly within the territory of the state. Its subjective application confers jurisdiction for crimes that begun within the territory of the state but were completed or consummated abroad, *e.g.* shooting from the territory of the forum a person being across the borders in a foreign state. On the contrary, the objective application of the principle concerns crimes that commenced abroad but were completed or consummated in the forum. The most well-known example of the objective territoriality principle is the *Lotus* case.[5]

There are some exceptions to the territoriality principle, namely for states, heads of states, diplomatic envoys, armed forces etc. Nonetheless, these exceptions do not regard prescriptive criminal jurisdiction.[6]

2 *The Active Nationality Principle*

Pursuant to the active nationality (or active personality) principle, the state may assert jurisdiction on criminal acts of its nationals abroad.[7] It is usual, however, that such jurisdiction is claimed under specific conditions, *e.g.* it regards only seri-

2 I. Brownlie, *Principles of Public International Law*, Oxford 2008, p. 299; R. Jennings & A. Watts, *Oppenheim's International Law*, London 1992, pp. 456-457.

3 *See* details in Brownlie 2008, pp. 299-301; D.W. Bowett, 'Jurisdiction: Changing Patterns of Authority over Activities and Resources', *British Yearbook of International Law*, Vol. 53, 1983, p. 1; Jennings & Watts 1992, pp. 458-461; M. Shaw, *International Law*, Cambridge 2008, pp. 579-584.

4 B. Cheng, *Studies in International Space Law*, London 1997, p. 387.

5 PCIJ Series A, No. 10, 1927. In that case the PCIJ justified Turkey, whose courts found guilty the watchman and the captain of a French steamer for the collision with a Turkish collier on the High Seas, which resulted in the death of persons aboard the Turkish ship. Turkey had argued that a ship on the High Seas forms part of the State whose flag is flying. The PCIJ observed that States are free to determine their jurisdiction, unless there is a prohibitive rule of international law. This decision of the PCIJ has been greatly criticised and the jurisdictional rule expressed therein was abandoned by the ICJ in the *Fisheries* case (ICJ Reports 1951, 16) and *Nottebohm* case (ICJ Reports 1955, 4).

6 Jennings & Watts 1992, pp. 460-461.

7 *See* details on the nationality principle in Bowett 1983, pp. 7-10; Brownlie 2008, p. 302; Jenning & Watts 1992, p. 463; Shaw 2008, p. 588.

European Journal of Law Reform 2016 (18) 1
doi: 10.5553/EJLR/138723702016018001007

ous crimes, the offence is also punishable under the law of the state where it occurred or the victim was also a national of the forum.

3 The Passive Nationality Principle

The passive nationality (or passive nationality principle)[8] attributes jurisdiction to the courts of a state when the victim of a crime abroad was its national. This principle has met limited acceptance under international law. Nevertheless, it is recognized for certain crimes, *e.g.* terrorism, aircraft hijacking, war crimes.

4 The Protective or Security Principle

According to the protective or security principle, a state asserts jurisdiction over aliens for acts committed abroad which affect its security.[9] It involves mainly crimes of a political nature (*e.g.* treason, espionage), currency crimes (*e.g.* counterfeiting), immigration and economic offences. The protective principle is often used in treaties providing for multiple jurisdictional grounds pertaining to certain offences (*e.g.* hostage taking, unlawful seizure of aircraft).

5 The Universality Principle

The universality principle recognizes the jurisdiction of every state to try certain offences, because they are considered particularly offensive to the international community as a whole.[10] Such offences can be repressed by virtue of international law by any state as a matter of international public policy, regardless of the place of their commission or the nationality of the persons involved. Examples are piracy, war crimes, crimes against humanity and crimes against peace.

6 The Effects Principle

The effects principle allows the extra-territorial application of domestic law of a state, in case that the behaviour of a foreigner abroad produces effects within its territory.[11] It regards mainly competition issues. This principle is highly controversial and has not been widely accepted.

II Extradition

Closely related to the exercise of criminal jurisdiction is the problem of extradition. Extradition enables one state to hand over to another state a suspected or convinced criminal who has fled abroad.[12] It is regulated through bilateral treaties and is not part of international customary law. Such treaties define specific crimes for which extradition can be asked. Extradition is granted for the criminal

8 *See* details in Bowett 1983, p. 10; Brownlie 2008, p. 302; Jennings & Watts 1992, pp. 471-472; Shaw 2008, pp. 590-591.

9 *See* details in Bowett 1983, pp. 10-11; Brownlie 2008, p. 302; Jennings & Watts 1992, pp. 470-471; Shaw 2008, pp. 591-592.

10 *See* details in Bowett 1983, pp. 11-14; Brownlie 2008, p. 303; Jennings & Watts 1992, pp. 469-470; Shaw 2008, pp. 592-604.

11 *See* details Bowett 1983, p. 7; Jennings & Watts 1992, pp. 473-475; Shaw 2008, p. 612.

12 S. Hobe & O. Kimminich, *Einführung in das Völkerrecht*, Tübingen 2004, p. 91; Shaw 2008, pp. 610-611.

prosecution of only the crime which formed the basis of the extradition demand. Extradition may be refused, if political asylum is granted to the alleged offender.

Many treaties on international criminal law foresee that states parties in whose territory the alleged offender is found have to either prosecute or extradite him/her (*aut dedere aut judicare*). Furthermore, such treaties often provide the basis for extradition in case that a bilateral extradition treaty does not exist between the state parties concerned.[13]

III Command Authority

Command authority regards the disciplinary powers assigned to a person in charge of a transportation vehicle, to ensure the safety of the transportation. In international law, there are special rules on command authority regarding ships and aircraft. These rules foresee that the master of the ship and the pilot-in-command of the aircraft are ultimately responsible for the safety of persons on board. They have the highest authority on board and all persons should abide by their directions. Refusal to comply may bring about proportionate disciplinary measures, which in extreme cases include physical restraint and disembarkation.[14]

B Criminal Issues under Current International Space Law

Criminal issues regarding space objects are regulated by the provisions of the Outer Space Treaty (OST),[15] the Moon Agreement (MA)[16] and the special rules on the International Space Station.

I Outer Space Treaty

Art. VIII OST attributes to the state of registry the right to exercise jurisdiction and control over the space object – "A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body." Such jurisdiction includes criminal jurisdiction and command authority.

13 *E.g.* Arts. 7 and 8 of the Convention for the Suppression of Unlawful Seizure of Aircraft, signed at The Hague on 16 December 1970, in force since 14 October 1971; Arts. 8 and 10 of the International Convention against the taking of hostages, signed at New York on 18 December 1979, in force since 3 June 1983.

14 On aviation law *see* Arts. 7-10 of the Convention on Offences and Certain Other Acts Committed on Board Aircraft, signed at Tokyo on 14 September 1963, in force since 4 December 1969. The disciplinary authority of the ship's master is foreseen in national pieces of legislation and is a recognised principle of international customary law.

15 Treaty on principles governing the activities of states in the exploration and use of outer space, including the moon and other celestial bodies, signed at Washington, London, Moscow on 27 January, 1967, in force since 10 October 1967.

16 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, signed at New York on 5 December 1979, in force since 11 July 1984.

European Journal of Law Reform 2016 (18) 1
doi: 10.5553/EJLR/138723702016018001007

1 *Criminal Jurisdiction*

The general jurisdictional rule of Art. VIII OST includes criminal jurisdiction. Nevertheless, the state of registry does not have exclusive jurisdiction, which means that additional grounds for the exercise of criminal jurisdiction could be provided by other principles Art. VIII OST does not use the words "exclusive jurisdiction," but simply "jurisdiction." At the same time, accepting exclusivity would not be very useful; there would be no reason to prohibit another state from exercising criminal jurisdiction based on an internationally recognized principle, if the state of registry decided not to prosecute. Yet, the fact that only the state of registry is mentioned should not be underestimated. Therefore, it has to be accepted that the state of registry has primary jurisdiction.[17] Such primacy does not imply that the state of registry is at the top of a jurisdictional hierarchy but that it is the starting point in the investigation of the law applicable to criminal occurrences on board a space object.

In this investigation, Art. IX OST could play a helpful role. This Article lays down the duty of states to co-operate and consult each other, if a space activity, planned or under implementation, causes harmful interference with the activities of other states. Although the exercise of criminal jurisdiction as such does not interfere with the activities of other states, Art. IX could oblige the state of registry to refrain from exercising its jurisdiction over foreign nationals, before consulting their national state(s).

2 *Command Authority*

Another corollary of the jurisdiction of the state of registry is the disciplinary authority of the vehicle's commander. The authority of the commander to maintain good order and discipline is a recognized principle of international law, which has been applied to ship and aircraft and by virtue of Art. VIII OST is extended to spacecraft. The commander is accepted as the representative of the state of registry, to whom that state's jurisdiction has been delegated.[18] Although general international space law has not defined the exact content of the command authority, it can be identified by reference to US and Russian domestic space law, which in turn have been influenced by public international law applicable to ships and aircraft.[19]

As to US law, 14 CFR 1214.7 established the authority of the Space Shuttle commander to enforce order and discipline during all flight phases of a Shuttle flight and to take whatever action in his/her judgement was necessary for the protection and safety of all persons and equipment on board. The commander had authority throughout the flight to use any reasonable and necessary means,

17 S. Gorove, 'Criminal Jurisdiction in Outer Space', *in The International Lawyer*, Vol. 6, 1972, p. 313, at 316-317; C.W. Jenks, *Space Law*, London 1965, p. 294.

18 Jenks 1965, p. 238; G.P. Sloup, 'Legal Regime of International Space Flights: Criminal Jurisdiction and Command Authority Aboard the Space Shuttle/Spacelab', *in* S. Gorove (Ed.), *The Space Shuttle and the Law*, Mississippi 1980, p. 77, at 86.

19 M. Chatzipanagiotis, R. Moro-Aguilar, 'Criminal Jurisdiction in International Space Law: Future Challenges in View of the ISS IGA', *Proceedings of the 57th (2014) Colloquium on the Law of Outer Space*, Eleven International Publishing, The Hague 2015, p. 323, at 329-330.

including the use of physical force, to achieve this end. He/she could also subject any of the persons on board to such restraint as the circumstances require until such time as delivery of this person to the proper authorities is possible.[20] Everybody on board was obliged to conform to the commander's orders and directions.[21]

Art. 20(3) of the Russian Law on Space Activity makes the spacecraft commander responsible for the safety of the space object and all persons and property on board. The commander is vested with all necessary powers to conduct the flight and command over the persons on board.

II The Moon Agreement

The Moon Agreement (MA) has entered into force, but none of the major space powers has ratified it; therefore, its importance *de lege lata* remains limited.

The MA contains provisions on jurisdiction that elaborate on Art. VIII OST. Art. 12(1) foresees that

> States Parties shall retain jurisdiction and control over their personnel, vehicles, equipment, facilities, stations and installations on the moon. The ownership of space vehicles, equipment, facilities, stations and installations shall not be affected by their presence on the moon.

This means that state parties retain quasi-territorial jurisdiction on lunar bases and other installations. As to personal jurisdiction, the wording of the provision ('over their personnel') indicates that the active nationality principle is also recognized.

Furthermore, Art. 17 MA lays down the duty of states to conduct international consultation to avoid interference with each other and prevent tensions. Allegations of criminal behaviour and issues of criminal jurisdiction are among the subjects requiring international consultation.

Art. 16 MA stipulates that the provisions of the agreement are also applicable to intergovernmental organizations conducting space activities, if such organization accepts to be bound by it. This could be useful especially for ESA, although ESA has not expressed any intention thereto.

In sum, the MA mainly complements the pertinent provisions of the OST, without establishing any new rules.

III International Space Station

The International Space Station (ISS) is the first truly multinational endeavour conducted in outer space. It serves as an orbital scientific laboratory, where a great variety of experiments and studies take place.[22]

20 § 1214.702, 45 FR 14845, 7 March 1980, as amended at 56 FR 27900, 18 June 1991.

21 § 1214.704, 45 FR 14845, 7 March 1980, as amended at 56 FR 27900, 18 June 1991.

22 For a brief description on international co-operation regarding the ISS and the IGA *see* NASA's presentation before the UNCOPUOS Legal Subcommittee in 2013, available at: <www.unoosa.org/pdf/pres/lsc2013/tech-02E.pdf>, last visited on 11 June 2016.

European Journal of Law Reform 2016 (18) 1
doi: 10.5553/EJLR/138723702016018001007

The ISS is regulated by the Inter-Governmental Agreement (IGA),[23] signed in 1998 by the United States, Russia, Canada, Japan and twelve ESA member states.[24] As to criminal and disciplinary matters of operations on board the ISS, there are special provisions in the Intergovernmental Agreement on the ISS (IGA) and the ISS Crew Code of Conduct (CCOC).[25]

The CCOC governs the behaviour of astronauts aboard the ISS and stems from the necessity to subject these persons to certain rules, including respect of hierarchy and commands given. Its main objective is to provide for a course of action concerning sanctions for violation of the rules contained therein.[26]

1 Criminal Jurisdiction

Art. 22 IGA contains special rules on criminal jurisdiction on board the ISS. These rules supersede the general jurisdictional rules foreseen in Art. 5 IGA, which foresees that each partner state will register as space objects those flight elements (modules and other main components) that it contributed to the station and thus will retain jurisdiction and control over said elements, as well as overall personnel in the ISS who are its nationals.

a Primary Basis

The main principle endorsed in the IGA for criminal matters is the active nationality principle. According to Art. 22(1), each partner state can exercise criminal jurisdiction in any flight element of the ISS over alleged offenders who are its nationals.

There are several reasons that explain why this approach was adopted.

The first one has its roots in sovereign immunity, according to which a state and its representatives cannot be tried by another state. Sovereign immunity is derived from the principle of equality of states.[27] It applies not only to heads of states and members of the government, but also to other persons who represent their national state, such as ambassadors, consuls and military personnel. In the same vein, professional astronauts (as opposed to 'space tourists'), who are state employees, can be regarded as representatives of their national states.

23 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, done in Washington on 29 January 1998, in force since 27 March 2001.

24 The 1998 IGA superseded the original IGA that had been signed in 1988 by the USA, ESA, Japan and Canada. The main goal of the new IGA was to include the Russian Federation into the ISS partnership. Furthermore, a number of the original provisions were modified by the new IGA, in particular the criminal law provisions. On the original 1988 criminal rules and the reasons behind their replacement in 1998, *see* H.P. Sinha, 'Criminal Jurisdiction on the ISS', *Journal of Space Law*, Vol. 30, Spring 2004, pp. 85-127.

25 *See* an analysis of these provisions also in Chatzipanagiotis & Moro-Aguilar 2015, pp. 330-333.

26 A. Farand, 'Astronauts' Behaviour on Board the International Space Station: Regulatory Framework', *in* UNESCO, *Legal and Ethical Framework for Astronauts in Space Sojourns*, Conference Proceedings, Paris 2004, p. 70, at 71-72.

27 Art. 2(1) of the UN Charter.

Closely related to sovereign immunity is international courtesy. No state would like to see its astronauts, who are often considered heroes in their respective countries, subject to a criminal procedure before the authorities of another state, let alone to have them sentenced to a severe penalty. Therefore, the solution chosen was the priority of the active nationality principle.

The third reason lies in the fact that the European partner states work together in ESA. Although ESA is not a state but an international organization, it owns and has registered the *Columbus* module and several other flight elements.[28] Adopting the quasi-territoriality, principle would result in a jurisdictional chaos if a crime were to be committed on board any of the European flight elements, because it would be impossible to determine which national law of the ESA member states should apply in the particular case.

A fourth reason is also of practical nature. ISS crewmembers move freely all over the station and use all habitable modules, regardless of the state that has registered them. In this context, the location of an alleged offence could be entirely fortuitous. Furthermore, an offence could be committed in more than one modules at the same time, *e.g.* an astronaut located in the module of state B shoots a weapon[29] and injures another astronaut located in the module of state C.

In order to eliminate all these practical problems, the territoriality principle was again excluded, and instead, the active nationality principle was adopted as the basic rule for criminal matters on the ISS.

b Secondary Bases – Extradition

Art. 22(2) IGA lays down the passive personality and the quasi-territorial principle as secondary jurisdictional principles. A partner state may exercise criminal jurisdiction, if the crime has affected the life or safety of one of its nationals, or it has caused damage to its flight element or has occurred thereon.[30] Thus, national interests are also taken into account.[31] Nevertheless, such jurisdiction can only be claimed, under two conditions: first, consultations with the national state of the alleged offender have been made; second, the latter, within 90 days from the date of consultations or any other agreed period, has either concurred with the exercise of jurisdiction by the other state or has failed to provide assurances that the case will be submitted to its criminal authorities.[32]

The latter condition is a very diplomatic and subtle form of the principle *aut dedere aut judicare*, in line with the highly co-operative nature of the ISS undertaking. The principle *aut dedere aut judicare* was developed in the 1960s, an era of high political tensions, mainly as a response to terrorist attacks against aircraft and aviation facilities, to prevent alleged offenders from escaping trial by resorting to states that for whatever reason were uninterested in prosecuting them.

28 T.A. De Roos, 'Disciplinary and Criminal Law in Space', *in* F.G. von der Dunk & M.M.T.A. Brus (Eds.), *The International Space Station*, Leiden/Boston 2006, p. 115, at 121.

29 As for the actual chances of finding fire weapons on the ISS, *see* <http://spectrum.ieee.org/tech-talk/aerospace/space-flight/how-i-stop-cosmonauts-carrying-guns>, last visited on 11 June 2016.

30 Art. 22(2) (1) IGA.

31 De Roos 2006, p. 121.

32 Art. 22(2) (2) IGA.

European Journal of Law Reform 2016 (18) 1
doi: 10.5553/EJLR/138723702016018001007

Thus, it was developed to meet regulatory necessities arising in a totally different operational and political context. As a result, this principle in its basic form would be unsuitable for the ISS, the success of which has been based on mutual trust and co-operation among partner states. Besides, the alleged offenders in this case will not be suspected terrorists but highly trained professional astronauts, selected through vigorous proceedings that include psychological and behavioural tests.

In any case, and for the purposes of extradition of any alleged offender, the IGA can provide the necessary legal basis, if an extradition treaty has not been signed between the states concerned.[33]

Moreover, mutual assistance between the affected partner states is required (Art. 22.4 IGA). The latter clause is particularly relevant for purposes of enabling the investigation of an offense, such as delivering the evidence (if any) of the crime to the state that, according to Art. 22, will be exerting its jurisdiction over the case.

Nonetheless, the aforementioned provisions are only valid for nationals of the partner states of the IGA. Nationals of third states on board the ISS are subject to the general jurisdictional rules of Art. VIII OST. Thus, if such persons commit a crime on board the ISS, they will be subject to the jurisdiction of the state having registered the flight element where the crime was committed.[34]

2 *Authority of the Commander*

The authority of the ISS commander is laid down in the ISS Crew Code of Conduct (CCOC).[35] The CCOC is applicable to all persons on board the ISS regardless their formal status.[36] Part III lit. A CCOC regulates the authority and responsibilities of the ISS commander.

The commander is responsible on board the ISS for the safety and well-being of all persons and for maintaining good order and discipline. She/he has the ultimate authority on board the ISS and has the right to use any reasonable and necessary means to fulfil his/her duties. The right to use proportionate force or restraint a person must be assumed in this regard although not explicitly mentioned, for it is justified by the need to ensure the immediate safety of the crew members and the ISS itself.[37]

Furthermore, the ISS commander has to promote a harmonious and cohesive relationship among the ISS crewmembers as well as to assure an appropriate level

33 Art. 22(3) IGA.

34 De Roos 2006, pp. 122-123; Farand 2004, p. 77.

35 The CCOC was called for by Art. 11 of the IGA. It was developed by NASA in collaboration with all the other Partner States and adopted in September 2000. It provides, among other things, the parameters of the command authority on board the ISS. Its rules have mainly an administrative nature. Nevertheless, the CCOC expressly states that its rules shall not limit the application of the criminal provisions of Art. 22 of the IGA. The CCOC is rather a complement to such rules.

36 According to the definitions of the CCOC "ISS crewmembers means any person approved for flight to the ISS, including both ISS expedition crew and visiting crew, beginning upon assignment to the crew for a specific and ending upon completion of the post flight activities related to the mission".

37 De Roos 2006, p. 119; Farand 2004, p. 75.

of mutual confidence and respect that takes into consideration the international and multicultural elements of the ISS missions. The main idea behind this provision was to deal with interpersonal or group harassment. Disagreements among the partner states on the exact definition of harassment led to this wording,[38] which has been criticized for lack of functionality.[39]

It has also to be underlined that the ISS Commander is entitled to change the scheduled routine activities of the other crewmembers, in order to cope with contingencies and safety problems.[40] This provision allows for flexibility on board, in order to meet unexpected circumstances related to the safety of the station and the persons on board crew and the ISS, and highlights the Commander's responsibility in this regard.

C Future Challenges

The advent of technology, the continuously more active involvement of private entities in space operations and the extension of human space exploration beyond low earth orbit (LEO)[41] create new challenges for international space law, also regarding criminal issues. Such challenges regard mainly (1) aerospace vehicles, (2) private space stations and (3) interplanetary missions and human settlements on celestial bodies.[42]

I Aerospace Vehicles

Aerospace vehicles are hybrid vehicles that combine flying methods used in aircraft (air-breathing engines, gliding in the atmosphere) and space objects (rocket propulsion). Since such objects could be seen both as aircraft and space objects at different stages of flight, aviation criminal law might apply to at least certain stages of flight. The latter includes special rules both on jurisdiction and on crimes against the security of aviation.[43]

It is disputed whether the flights of such vehicles should be regarded as aviation or space flights or both. Mainly two theories attempt to answer this ques-

38 Farand 2004, p. 74.

39 De Roos 2006, p. 119.

40 Section III.C of the ISS CCOC.

41 Low earth orbit indicates orbits about 2,000 kilometres above the earth surface, with periods of 127 minutes or less – IAA, *Cosmic study on space management*, Paris 2006, p. 21. With the exception of the US flights to the moon, all manned space activity so far, has been conducted in the LEO.

42 On criminal rules regarding private space stations and interplanetary missions *see also* Chatzipanagiotis & Aguilar 2015, pp. 333-336.

43 *E.g.* unlawful seizure of aircraft, use of force against aircraft, passengers and air navigation facilities, armed attacks against airports etc. The main international instruments thereon in force are the Convention on offences and certain other acts committed on board aircraft, signed at Tokyo on 14 September 1963, the Convention on the unlawful seizure of aircraft, signed at The Hague on 16 September 1970, the Convention on the suppression of unlawful acts against the safety of civil aviation, concluded at Montreal on 23 September 1971 and its supplementary Protocol for the suppression of unlawful acts of violence at airports serving international civil aviation, concluded at Montreal on 24 February 1988.

European Journal of Law Reform 2016 (18) 1
doi: 10.5553/EJLR/138723702016018001007

tion: the spatial theory and the functional theory. However, the final answer depends on the provisions of the applicable national law, which means that a final answer can be given only on a case-by-case basis.

According to the spatial theory, we should examine where the flight takes place. We have an aviation flight, as long as the flight occurs in airspace, and a spaceflight, as long as it occurs in outer space. The problem is that there is no internationally agreed delimitation of outer space, despite numerous suggested solutions. In the last years, the advent of private suborbital flights after the 2004 X-Prize competition has promoted the view that outer space begins at an altitude of 100 kilometres above sea level. Thus, according to this theory suborbital flights are aviation flights until the altitude of 100 kilometres and spaceflights thereafter.

The functional theory suggests that critical is the objective of the flight. If the aim of the flight is the exploration and use of outer space, then we have a spaceflight. If the purpose of the flight is transportation between two points on the surface of the earth, then we have an aviation flight.

Another criterion often used by the functional theory is the technical configuration of the flying vehicle, *i.e.* the distinction between aircraft and space objects. According to the International Civil Aviation Organization (ICAO), an aircraft is any device that can derive support in the atmosphere from the reactions of the air on its surface. The ICAO definition has been adopted by most national aviation laws, sometimes with slight variations. Therefore, all devices that glide in the atmosphere or use air-breathing engines to fly would be aircraft under this definition. On the contrary, vehicles using exclusively ballistic methods of flight would not qualify as aircraft.

We should also note here that some domestic aviation laws have adopted a spatial definition of aircraft adopted. According to such definition, all devices flying in the airspace are aircraft, irrespective of their technical characteristics.[44]

There is no internationally accepted definition of space object. However, the provisions of the international space law conventions as well as of national space laws seem to suggest that a space object is any artificial device launched or intended to be launched into outer space and designed to move and operate in outer space, as well as any component part and launch vehicle of such device. Orbital capacity is not a requirement.[45]

Thus, *de lege lata* the national law applicable to the flight will determine whether aviation or space law will apply to criminal occurrences during the flight. This would be in most cases the law of the state of registry. However, such solution creates legal uncertainty. Therefore, *de lege ferenda* common rules should

44 *E.g.* 49 USC 40102(6); Art. L110-1 French CAC; § 11(1) Austrian LFG. *See also* § 1(2) German LuftVG, which considers "aircraft" all machines moving in the air, expressly including rockets and similar objects.

45 *See* details on the notion of "space object" *in* M. Chatzipanagiotis, *The Legal Status of Space Tourists in the Framework of Commercial Suborbital Flights*, Cologne 2011, pp. 20-25, with extensive citations.

apply to all aerospace vehicles, regardless of the flight objective and their technical characteristics.[46]

II Private Space Stations

Private space stations are expected to consist of one[47] or more modules,[48] which could be leased separately to interested persons, including sovereign entities.[49] They will probably be operated by a single private entity, which means that the operation of the private space station will require authorization and supervision by the appropriate state, according to Art. VI OST, which will be most probably the state of registry. Private orbital stations are intended to serve either as space hotels for wealthy individuals (space tourism) or as orbital scientific laboratories.

1 Space Tourism

From a jurisdictional point of view, space tourism will be quite straightforward. Since a single entity will be responsible for the station and the occupants will be staying on board the station for a short period, the traditional rule of Art. VIII OST will apply. Hence, criminal jurisdiction will rest primarily with the state of registry.

Other jurisdictional grounds, such as the active or passive nationality principle, would not be excluded. However, the situation surrounding the occupants will not be as sensitive as aboard the ISS, where professional astronauts representing partner states stay for a long time in orbit. Political balances on board private space stations will be far less important compared to the ISS. Therefore, the ISS particularities that led to the creation of a special jurisdictional regime will not be relevant to private space stations used for recreational purposes.

On the contrary, the frequent change of occupants combined with the need of continuous monitoring of the station's operations underline the need to attribute criminal jurisdiction to a single state, the state of registry.

Therefore, for recreational orbital stations, the jurisdictional rules laid down in Article VIII OST would be best fit.

As to extradition, existing bilateral treaties could be used. Since orbital staying for recreational purposes will be a private endeavour from both the supply and the demand side, no special agreements are necessary. From a jurisdictional perspective, the situation of orbital hotels will be comparable to that of hotels on earth, which accept guests from all over the world.

46 *See* more details thereon in Chatzipanagiotis 2011, pp. 26-29 and 54.

47 *See e.g.* <www.i-newswire.com/press-release/spacetek-signs-mou-with-excalibur-almaz>, last visited on 11 June 2016, for the operation of the Salyut Space Station by Excalibur Almaz and SpaceTek.

48 *E.g.* the modules developed by Bigelow Airspace <http://bigelowaerospace.com/b330/>, last visited on 11 June 2016.

49 *See e.g.* <http://bigelowaerospace.com/about/opportunities-pricing-services/>, last visited on 11 June 2016, on the plans of Bigelow Aerospace to lease capacity on board its space stations to different States to develop their space capabilities. *See also* <http://spectrum.ieee.org/tech-talk/aerospace/space-flight/private-space-habitat-to-blow-up-on-iss-next-year?utm_source=NSN+%23113+-+November+2014&utm_campaign=NSN-1&utm_medium=email>, last visited on 11 June 2016.

European Journal of Law Reform 2016 (18) 1
doi: 10.5553/EJLR/138723702016018001007

As to maintaining public order on board private space stations, it is the operator, represented by the commander and by mission control, who would be responsible in the first place for maintaining disciplinary authority on board. However, the state of registry would also be ultimately competent to guarantee the safety of the space station, in accordance with Arts. VI and VII of the OST, coupled with security on board, in accordance with Art. VIII OST. The state of registry should also vest the station's commander with disciplinary authority for incidents on board.

2 Private Laboratories in Orbit

To some extent, the same situation will apply to private space stations used as orbital laboratories for scientific purposes.

However, sovereign entities are likely to be involved in the utilization of capacity on board such stations, which may bring about the need for *ad hoc* jurisdictional agreements. If a state undertakes to send one or more persons to a private space station, in order to receive astronaut training or conduct scientific experiments, then it may be useful for the state of registry to sign special jurisdictional agreements with the national state of such persons, to avoid jurisdictional conflicts. Such agreements could foresee that the state of registry will refrain from exercising its jurisdiction over alleged misconduct, as long as the overall safety and the integrity of the station have not been seriously jeopardized. In such case, the national state of the alleged offender may have a greater interest than the state of registry to exercise its jurisdiction. Furthermore, special extradition agreements would be very useful in this regard, as they could ease potential tension between the states involved.

Consequently, private orbital space stations used for scientific purposes could be subject to a jurisdictional regime similar to that of the ISS.

III Interplanetary Missions and Human Settlements on Celestial Bodies

Human interplanetary missions and settlements on celestial bodies will be the most challenging endeavours ever undertaken, also from a jurisdictional point of view.

As to interplanetary missions, the exploration vehicle envisaged at present, the Orion capsule, will consist of a single module. However, long-term human presence in space requires a much more spacious vehicle, mainly to cope with astronaut health and behavioural issues. Therefore, it cannot be excluded that a larger exploration vehicle, comprised of more modules, will be constructed in orbit, before the journey to another celestial body begins. In addition, the undertaking will be so demanding that it will require international co-operation,[50] thus comprising a multinational crew.

50 Study on Mars National Research Council, *Pathways to Exploration: Rationales and Approaches for a U.S. Program of Human Space Exploration*, Washington DC 2014, p. 158, available at <www.nap.edu/catalog.php?record_id=18801>, last visited on 11 June 2016; IAA, *Future of Human Spaceflight: The Need for International Cooperation*, Paris 2010, pp. 21-22, available at <http://iaaweb.org/iaa/Summit/IAA_Study-Human_Spaceflight.pdf>, last visited on 11 June 2016.

The same will be valid for human settlements on celestial bodies, such as the moon and mars, which would be much more demanding that 'simply' getting there. Different modules are expected to be used to construct habitats on celestial bodies and provide the necessary supplies and infrastructure to support human presence thereon.[51]

It is noteworthy that studies on human space exploration recommend using in the design and implementation of future manned missions the international-co-operation experience gained from the ISS.[52] The general architectural similarities of such missions to the ISS render also the regulatory situation analogous to the ISS.

Consequently, the paradigm of the ISS should be followed as to criminal jurisdiction. The ISS IGA has provided a practical solution to problems of concurrent jurisdictions, based on international consensus. It takes into account national sensitivities, while allowing for flexibility in the particular case through *ad hoc* consultations on the exercise of jurisdiction and extradition. Hence, the active nationality principle should be given primacy, without excluding other jurisdictional bases. Attributing secondary importance to the principle of quasi-territoriality in favour of the active nationality entails an additional jurisdictional advantage: the active nationality would be applicable also on the surface of mars (or other celestial bodies) during extra-vehicular activities or activities outside the constructed bases. Thus, there will be regulatory uniformity covering all stages of the manned mission.

Concerning extradition, it would be useful to include a special provision foreseeing the variation of the principle *aut dedere aut judicare* as adopted in the ISS IGA. This would help ease tension and decrease jurisdictional conflicts. Any alleged criminal misconduct and the related jurisdictional issues are to be resolved through good-faith negotiations, to safeguard trust among the partner states.

Additionally, a Crew Code of Conduct similar to the one adopted for the ISS would provide the rules necessary to safeguard the harmonious relationship among the crew members. Following the example of the ISS provisions, command authority will play a significant role in this regard. In fact, since external help or intervention will be possible to a very limited extent owing to the distance of the vehicle or the celestial settlement from the earth, and the crew will have to tackle any potential problems mainly by themselves, it may be necessary on the one hand to have more detailed provisions in place, but on the other hand to ensure flexibility in decision-making on board so as to deal effectively with unexpected issues. The exact regulatory requirements, however, could only be specified once the exact mission profile has been identified.

51 *See e.g.* International Exploration Coordinating Group, *Reference Architecture for Human Lunar Exploration*, Summary report, 2010, p. 15, available at <www.lpi.usra.edu/lunar/strategies/ISECGLunarRefArchitectureJuly2010.pdf>, last visited on 11 June 2016.

52 IAA, *Future of Human Spaceflight* 2010, pp. 21, 26; IECG, *Reference Architecture for Human Lunar Exploration* 2010, pp. 21-22.

European Journal of Law Reform 2016 (18) 1
doi: 10.5553/EJLR/138723702016018001007

D Conclusion

The OST confers criminal jurisdiction primarily to the state of registry of the space object, without excluding the exercise of jurisdiction on other grounds. Closely connected with the jurisdiction of the state of registry is the disciplinary authority of the commander, which follows the rules laid down in international maritime and aviation law. The MA does not innovate in this regard and its rules mainly complement the OST. Extradition issues are regulated bilaterally between the states concerned.

The legal regime governing the ISS contains special provisions on criminal jurisdiction that take into account the highly co-operative nature of the undertaking. Therefore, the active nationality principle has precedence, followed by the quasi-territoriality and the passive nationality principles. Rules on extradition and command authority are also foreseen.

Future challenges on international criminal law of outer space should be dealt with case by case.

Aerospace vehicles could be deemed aircraft in some cases and aviation criminal law might apply *de lege lata*, depending on the mission profile and the vehicle specifications. However, *de lege ferenda* the same rules should be applicable to all vehicles.

Concerning private space stations, which will most likely be registered as space objects by one single state, the appropriate solution will depend on their use. If they are used by individuals for recreation, then the political and technical rationale underlying the adoption of the ISS IGA rules on criminal jurisdiction does not exist; it would be preferable to have the basic jurisdictional of Art. VIII OST applied. Yet, if the orbital station is used by sovereign entities, special jurisdiction agreements with the state of registry would be useful, to safeguard political balances.

The example of the ISS should be followed regarding interplanetary missions and human settlements. The magnitude of the technical challenges and the need to maximize the efficiency of the coordinated efforts require careful political balancing in the vein of the ISS IGA.