

'For All Moonkind'

Legal Issues of Human Settlements on the Moon: Jurisdiction, Freedom and Inclusiveness

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Abstract

After a long period of subdued interests in the Earth's single celestial companion, plans to send humankind back to the Moon are hatched in abundance again, and one major difference is that this time many of those plans focus on remaining there and ultimately build semi-permanent or even permanent habitats.

This obviously raises a number of issues that the short visits to the Moon by humankind so far, manned as well as unmanned, did not raise. Most fundamentally, the absence of exercise of jurisdiction on a territorial basis (as per Article II of the Outer Space Treaty) may no longer be sufficient to guarantee the baseline freedom of exploration and use (as per Article I of the Outer Space Treaty). Questions now arise as to how far the quasi-territorial jurisdiction over registered space objects (as per Article VIII of the Outer Space Treaty) can continue to exclude access to such space objects once transformed to or included in permanent habitats on the Moon in spite of the requisite free access to all areas as well as all stations and installations there (as per Articles I and XII of the Outer Space Treaty) and the similarly foundational understanding that activities on the Moon should be for the benefit and in the interests of all countries (as per Article I of the Outer Space Treaty). At what point would (hu)mankind settling on the Moon effectively become 'Moonkind', and what changes would, or should, that give rise to?

These are the overarching questions the present paper will tackle.

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1. Introduction

As the world recently celebrated the fiftieth anniversary of the first Moon landings and Neil Armstrong's legendary words "That's one small step for man, one giant leap for mankind", a flurry of activities evidenced renewed interest in the Moon: after many years of space activities focusing largely on low-Earth orbits or even suborbital flight, certainly as far as human spaceflight was concerned, the Moon is now 'back in business'.

A number of things, however, have changed fundamentally. First, in hindsight the reference in Armstrong's words should of course have been to '*humankind*'. Where back in those days women, no matter how unjustifiably, might have been well-nigh invisible in the space arena, today NASA's flagship program is Artemis, the female companion to Apollo, which should land the first woman (as well as the next man, at least as far as the United States is concerned) on the Moon by 2024.¹ Other novelties include the unmanned Chinese² and Israeli³ lunar landings which have fairly recently occurred; the introduction by the European Space Agency (ESA) of its very broad and open Moon Village concept;⁴ India's serious plans for lunar flights ultimately with crews;⁵ and a Japanese billionaire who has pre-booked a circumlunar flight with a private company.⁶

Several of those plans, indeed, go a fundamental step beyond the human activity which the Moon has so far observed from up close: no longer content to stay for a few days or maybe weeks, but seriously envisaging long-term settlement, maybe even forever. While this is often labelled 'colonisation', formally speaking that is no longer a legitimate concept: Article II of the Outer Space Treaty⁷ made it abundantly clear that the practice of powerful

1 See *e.g.* <https://www.nasa.gov/specials/artemis/> (last accessed 3 November 2020).

2 See *e.g.* <https://www.space.com/42883-china-first-landing-moon-far-side.html> (last accessed 3 November 2020).

3 See *e.g.* <https://www.nytimes.com/2019/04/11/science/israel-moon-landing-beresheet.html> (last accessed 3 November 2020).

4 See *e.g.* https://www.esa.int/About_Us/Ministerial_Council_2016/Moon_Village (last accessed 3 November 2020).

5 See *e.g.* <https://www.space.com/india-confirms-moon-landing-mission-chandrayaan-3.html> (last accessed 3 November 2020).

6 See *e.g.* <https://spaceflightnow.com/2018/09/18/japanese-billionaire-reserves-moon-flight-with-spacex/> (last accessed 3 November 2020).

7 Art. II, Outer Space Treaty (Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, London/Moscow/Washington, done 27 January 1967, entered into force 10 October 1967; 610 UNTS 205; TIAS 6347; 18 UST 2410; UKTS 1968 No. 10; Cmnd. 3198; ATS 1967 No. 24; 6 ILM 386 (1967)), provides: "Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means." See further *e.g.* F.G. von der Dunk, International space law, in

countries occupying far-flung territories and transforming them into 'colonies', already outlawed on Earth by the UN Charter,⁸ cannot be accepted on the Moon or other celestial bodies either.

The mere phenomenon of 'human settlement', however, is *not* as such outlawed, which in turn raises the question as to its precise legal parameters. These are not so easily determined: human settlement brings up issues of interpretation of various applicable fundamental legal principles and rules for the first time turning out to be potentially yet fundamentally incompatible with each other, and this also raises broader overall issues as to what humanity wants such human settlements to look like, on the Moon as well as – prospectively further into the future – on other celestial bodies. To what extent could such settlements enjoy the freedoms they might be striving for, and to what extent would these settlements be inclusive, in terms of representing people not only of all gender, but also nationality, colour, political persuasion *et cetera*, as together comprising 'humankind'? What does current international space law have to say about that, and what could respectively should be changed from that perspective?

The answers to these questions would largely derive from two international treaties (even if other regimes of international law – and ultimately also national law – may be relevant on specific issues as well): the 1967 Outer Space Treaty⁹ and the 1979 Moon Agreement.¹⁰

2. The Outer Space Treaty

The Outer Space Treaty, with currently 110 States parties including all major spacefaring nations, a further 23 States signatories¹¹ and a generally recognized status as throughout reflecting customary international law, is

Handbook of space law (Eds. F.G. von der Dunk & F. Tronchetti)(2015), 55-60; S.R. Freeland & R. Jakhu, Article II, in *Cologne Commentary on Space Law* (Eds. S. Hobe, B. Schmidt-Tedd & K.U. Schrogl) Vol. I (2009), 48-55.

- 8 Cf. already Art. 1(2), UN Charter (Charter of the United Nations, San Francisco, done 26 June 1945, entered into force 24 October 1945; USTS 993; 24 UST 2225; 59 Stat. 1031; 145 UKTS 805; UKTS 1946 No. 67; Cmd. 6666 & 6711; CTS 1945 No. 7; ATS 1945 No. 10; see further e.g. A. Cassese, *International Law* (2001), 285-6; G. Boas, *Public International Law* (2012), 194-200.
- 9 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (hereafter Outer Space Treaty), London/Moscow/Washington, done 27 January 1967, entered into force 10 October 1967; 610 UNTS 205; TIAS 6347; 18 UST 2410; UKTS 1968 No. 10; Cmnd. 3198; ATS 1967 No. 24; 6 ILM 386 (1967).
- 10 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (hereafter Moon Agreement), New York, done 18 December 1979, entered into force 11 July 1984; 1363 UNTS 3; ATS 1986 No. 14; 18 ILM 1434 (1979).
- 11 See <https://www.unoosa.org/documents/pdf/spacelaw/treatystatus/TreatiesStatus-2020E.pdf> (last accessed 3 November 2020).

generally perceived to provide the broad overarching framework agreement underlying all activities in outer space.¹² As a consequence, it does indeed provide also for the foundational legal principles applicable to human settlements on the Moon and other celestial bodies.

To start with, all of outer space is declared a *res communis*, a kind of ‘global commons’ “not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means”,¹³ which also gives rise to a default legal regime of freedom of “exploration and use (...) [as] the province of all mankind”.¹⁴

Such freedom, however, basically like any freedom is not without its boundaries. First, it applies only to States – at least as far as the Outer Space Treaty is concerned: Article I provides *them* with the above-quoted freedom of exploration and use, and the Treaty essentially allows activities by non-governmental entities only if subjected to “authorization and continuing supervision by the appropriate State”, holding the State whose “national activities in outer space”¹⁵ are at issue in any event internationally responsible for those activities.¹⁶

Second, activities are generally allowed only if undertaken “without discrimination of any kind, on a basis of equality and in accordance with international law”,¹⁷ respectively “in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding”,¹⁸ and as for the aforementioned international State responsibility, that refers to “assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty”¹⁹ which, also given the two earlier references, should be taken to refer to all of international space law as well. It should be noted, that the prohibition of ‘discrimination’ in this context as such (also) pertains to discrimination between *States*, as the main bearers of rights and obligations under public international law, and *not* to discrimination between individuals.

Third, the Outer Space Treaty developed a set of general rules pertaining to the two key subjects involved in space activities: astronauts and space objects

12 See further *e.g.* Von der Dunk (*supra* n. 7), 49-50, and literature quoted there.

13 Art. II, Outer Space Treaty (*supra* n. 9).

14 Art. I, Outer Space Treaty (*supra* n. 9).

15 Art. VI, Outer Space Treaty (*supra* n. 9).

16 In other words: it is up to such States to determine to what extent they would allow the private sector to enjoy such freedom as well, read relevant categories of national activities in space to be undertaken by non-governmental entities; see further *e.g.* M. Gerhard, Article VI, in *Cologne Commentary on Space Law* (Eds. S. Hobe, B. Schmidt-Tedd & K.U. Schrogl) *Vol. I* (2009), esp. 111-22.

17 Art. I, Outer Space Treaty (*supra* n. 9).

18 Art. III, Outer Space Treaty (*supra* n. 9).

19 Art. VI, Outer Space Treaty (*supra* n. 9).

respectively, effectively providing for some limitations to the freedom of States to handle those (certainly if belonging to other States) as they wish. As to the former, pursuant to Article V they were to be considered 'envoys of mankind' entitled to unconditional assistance in case of need as well as to safe and prompt return to their launching State if applicable. As to the latter, Article VIII allowed launching States to extend their domestic jurisdiction to space objects duly registered, as well as to any persons possibly on board.

A final set of legal boundaries to the principled freedom of activity applies more specifically to the celestial bodies only, as opposed to also including the void around them. "The Moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes", which obligation is then detailed to some extent with reference to prohibitions on the "establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres".²⁰ Also, space activities are not allowed to impede the fundamental right of "free access to all areas of celestial bodies",²¹ further elaborated by a clause stating that "[a]ll stations, installations, equipment and space vehicles on the Moon and other celestial bodies shall be open to representatives of other States Parties to the Treaty on a basis of reciprocity", subject in turn only to "reasonable advance notice", "appropriate consultations" and the right to take "maximum precautions"²² on the part of the visiting State.

When shortly after the adoption of the Outer Space Treaty with the first Moon landings the long-term development of lunar facilities seemed a feasible next step within the relatively near future, the Outer Space Treaty as such was already considered too general and unspecific to serve as the international legal regime for prolonged human presence on the Moon, and efforts were undertaken to refine, elaborate and as needed adapt the Outer Space Treaty's principles and clauses to this more specific context. The result of these efforts was, of course, the Moon Agreement.

3. The Moon Agreement

The Moon Agreement, indeed, in many ways did what it set out to do. It reiterated the main principles of the Outer Space Treaty so as not to leave any doubt about their applicability to the Moon and other celestial bodies, such as the 'global commons' character of celestial bodies as part of outer space and the characterization of its exploration and use as 'province of all mankind',²³ the application of international law including the UN Charter, the use of celestial bodies for exclusively peaceful purposes (made slightly

20 Art. IV, Outer Space Treaty (*supra* n. 9).

21 Art. I, Outer Space Treaty (*supra* n. 9).

22 Art. XII, Outer Space Treaty (*supra* n. 9).

23 See Arts. 4, 6, 8, 9, Moon Agreement (*supra* n. 10).

more explicit), the need for international cooperation and exchange of information, the (slightly elaborated) obligations to assist astronauts, and jurisdiction and control over personnel and space objects, international responsibility and international liability (to be yet further elaborated).²⁴ One clause of the Outer Space Treaty especially relevant also for long-term settlement, which was again made slightly more explicit by the Moon Agreement, concerned open access to areas of the Moon as well as installations and stations thereon.²⁵

While the Moon Agreement did not very much focus on long-term human habitation of the Moon either, it did at least address in some detail what could be seen as a necessary preliminary step for such settlement: the development of mineral and other natural resources on the Moon and other celestial bodies. That States were “[b]earing in mind the benefits which may be derived from the exploitation of the natural resources of the Moon and other celestial bodies”²⁶ was a major reason for the Moon Agreement to be drafted in the first place.

In this context, the key clauses were found in Article 11. It declared “[t]he Moon and its natural resources [to be] (...) the common heritage of mankind”,²⁷ purposefully deviating from the term ‘province of all mankind’ of Article 4(1) of the Moon Agreement and Article I of the Outer Space Treaty. While further clauses merely reiterated the prohibition of “national appropriation [of the Moon] by any claim of sovereignty, by means of use or occupation, or by any other means”²⁸ and the baseline right to freely explore and use the Moon “without discrimination of any kind”,²⁹ three further elements of Article 11 stood out as major novelties compared to the Outer Space Treaty, in elaboration precisely of this differentiation between the ‘common heritage of mankind’ and ‘province of all mankind’ concepts.

First, “[n]either the surface nor the subsurface of the Moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person”,³⁰ a specific extension of the prohibition of appropriation of any *area* of the Moon to the *resources* possibly found in such an area, at least as long as such resources would (still) be “in place”.

Second, the States parties to the Moon Agreement “hereby undertake to establish an international regime, including appropriate procedures, to

24 See Arts. 2, 3, 4, 10, 12, 14, Moon Agreement (*supra* n. 10).

25 Cf. Art. 9(2), Moon Agreement (*supra* n. 10).

26 Preamble, Moon Agreement (*supra* n. 10).

27 Art. 11(1), Moon Agreement (*supra* n. 10).

28 Art. 11(2), Moon Agreement (*supra* n. 10).

29 Art. 11(4), Moon Agreement (*supra* n. 10).

30 Art. 11(3), Moon Agreement (*supra* n. 10).

govern the exploitation of the natural resources of the Moon as such exploitation is about to become feasible. This provision shall be implemented in accordance with article 18 of this Agreement.”³¹

Third, while further details on the international regime to be established (a relatively lightweight regime such as under ITU auspices for coordination of space frequencies and orbital slots, still allowing for individual national licensing of the actual operators? A relatively heavyweight regime such as implemented for the deep seabed imposing an international licensing regime for any actual operators?³²) were left to be decided by the future conference(s) to be convened pursuant to Article 18, at least the “main purposes of the international regime to be established” were to include

- a) The orderly and safe development of the natural resources of the Moon;
- b) The rational management of those resources;
- c) The expansion of opportunities in the use of those resources;
- d) An equitable sharing by all States Parties in the benefits derived from those resources, whereby the interests and needs of the developing countries, as well as the efforts of those countries which have contributed either directly or indirectly to the exploration of the Moon, shall be given special consideration.³³

While the Moon Agreement by that token did at least try to set the parameters for the expected resource utilization of the Moon and other celestial bodies as an almost indispensable precondition for long-term human settlement, by the very same token ultimately it essentially failed to do so. Largely because of the (actual or likely) ramifications of the application of the ‘common heritage of mankind’ principle to the exploitation of the Moon in light of concurrent development of a very detailed elaboration and implementation of the very same principle in the context of deep seabed mining,³⁴ the Moon Agreement as of today only has 18 States parties, with a further four having signed but not ratified the Agreement.³⁵ Noting moreover that almost all leading spacefaring nations clearly distanced themselves from the Agreement, many consider the Moon Agreement a ‘failed treaty’ – and in

31 Art. 11(5), Moon Agreement (*supra* n. 10). Art. 18 provided for a summary procedure to convene a conference for such purposes; in the almost four decades since the entry into force of the Moon Agreement, however, no substantial efforts have been undertaken to convene such a conference.

32 *Cf.* also the discussion in F. Tronchetti, Legal aspects of space resource utilization, in *Handbook of Space Law* (Eds. F.G. von der Dunk & F. Tronchetti)(2015), 792-803.

33 Art. 11(7), Moon Agreement (*supra* n. 10).

34 See on this discussion *e.g.* Von der Dunk (*supra* n. 7), 101-3; Tronchetti (*supra* n. 32), 782-92.

35 See <https://www.unoosa.org/documents/pdf/spacelaw/treatystatus/TreatiesStatus-2020E.pdf> (last accessed 3 November 2020).

any event, it can hardly be said to have determined the legal status of the Moon and other celestial bodies for anyone outside of its rather limited number of adherents.

4. Towards Long-Term Human Settlement on the Moon

The potential or actual incompatibility of the regimes of the Outer Space Treaty respectively the Moon Agreement so far have only become an issue with respect to the seemingly impending exploitation of natural resources on celestial bodies. Now that, however, the likelihood that long-term human settlement on the Moon will be actively pursued is increasing, given that the Outer Space Treaty did not address such issues in any detail whereas the Moon Agreement, to the extent it *did* provide for a bit more detail, lacks legal relevance for most States, further analysis of the legal status becomes even more adamant.

Schematically speaking, even while acknowledging that for those States (also) parties to the Moon Agreement the substance may be different than for those States only parties to the Outer Space Treaty, only three legal conclusions at this stage are essentially beyond dispute: (1) there is a fundamental right of States to establish long-term human habitats on the Moon; (2) such a right can only be exercised subject to certain vague but general legal limitations as briefly surveyed above; and (3) (largely concomitant) rights of other States exist with respect to habitats thus established as similarly summarized before. It is the detailed application and interaction of these legal paradigms in the context of long-term human settlement which now has to be further assessed and addressed.

The baseline freedom of States to undertake space activities, and – to the extent properly authorized and continuously supervised by the appropriate State – the derogated freedom for their private sector entities to undertake them, of course includes the freedom of settling humans on the Moon. That should be the starting point for any further legal analysis. The fact that specific clauses regarding the freedom to land there, to access all areas and to establish stations and facilities were largely developed with short-duration human presence in mind, cannot as such mean that *a contrario* long-term settlement would be prohibited. Rather, the required recognition of a right of access to other States' stations and facilities on the Moon subject to some procedural conditions, drafted to ensure compliance with for instance the peaceful-purposes requirement,³⁶ confirms the basic rights for States to establish such stations and facilities in the first place, without in and of itself even suggesting any limit in terms of duration of their operation as such.

36 See e.g. L.J. Smith, Article XII, in *Cologne Commentary on Space Law* (Eds. S. Hobe, B. Schmidt-Tedd & K.U. Schrogl) Vol. I (2009), 208 ff.

Conversely, the prohibition on national appropriation, in particular given its details as applying regardless of whether achieved “by any claim of sovereignty, by means of use or occupation, or by any other means”³⁷ can only be taken to mean that *a contrario* use or occupation *as such* are allowed, the more so since otherwise many other clauses allowing activities on the Moon (such as per Articles XII of the Outer Space Treaty³⁸ and Articles 6 through 9 of the Moon Agreement³⁹) would not make any sense. Use and occupation are very much allowed – they just can, differently from terrestrial legal history, *never* give rise to national appropriation of relevant areas.

It should furthermore be noted that the exercise of sovereignty on a quasi-territorial basis over space objects duly registered by the relevant State, in accordance with Article VIII of the Outer Space Treaty as further elaborated by the Registration Convention,⁴⁰ even if equally drafted not with long-term habitation of such a space object on a celestial body in mind, continues to apply also while such a space object would be placed on the Moon – one particular presently relevant form of ‘use or occupation’ of the Moon.

The overarching legal conundrum concerning the extent of the legal right of a State to establish human settlements on the Moon, and the extent of its obligations and other States’ rights with respect to such settlements, then is:

When would ‘use or occupation’ morph into de facto, then de jure exercise of sovereignty with the result of violating the fundamental prohibition on national appropriation of Article II of the Outer Space Treaty?

The closest to an analogy at hand concerns the international regime applicable to satellite communications. While satellites are fully entitled to use a particular orbital slot or orbit once they have duly gone through the ITU coordination process⁴¹ and this, by the same token, is not considered a violation of the prohibition on national appropriation (of that slot or orbit) by Article II of the Outer Space Treaty, the principled reversion of the slot or orbit to the ‘pool’ of available slots and orbits, after the satellite has ceased

37 Art. II, Outer Space Treaty (*supra* n. 9); Art. 11(2), Moon Agreement (*supra* n. 10).

38 As discussed, Art. XII, Outer Space Treaty (*supra* n. 9), provides *i.a.* for rights of access to stations *etc.* on the Moon.

39 *E.g.*, Art. 7, Moon Agreement (*supra* n. 10) provides for an obligation to “prevent the disruption of the existing balance of (...) [the Moon’s] environment”, whereas Art. 9 specifically allows for the establishment of “manned and unmanned stations on the Moon”.

40 Convention on Registration of Objects Launched into Outer Space (hereafter Registration Convention), New York, done 14 January 1975, entered into force 15 September 1976; 1023 UNTS 15; TIAS 8480; 28 UST 695; UKTS 1978 No. 70; Cmnd. 6256; ATS 1986 No. 5; 14 ILM 43 (1975).

41 See *e.g.* F.G. von der Dunk, Legal aspects of satellite communications, in *Handbook of Space Law* (Eds. F.G. von der Dunk & F. Tronchetti) (2015), 464-84.

functioning, used to guarantee a *de facto* end – in the realm of within at most a few decades – to such occupation.⁴²

With increasing legal weight being attached to internationally accepted recommendations to de-orbit satellites after 25 years of operation⁴³ the argument could be made that, at least in the hotly-competed-for context of satellite slots and orbits, occupation of slots or orbits for something like two or three decades is not seen as violating the ban on non-appropriation, and therefore as legal.

It is rather debatable however whether that rough timeframe could without further ado be applied to human settlements on the Moon. It is one thing to legally force a satellite out of its orbit or slot after some 25 years (assuming for the sake of convenience that is already a matter of *lex lata*) – it is quite another thing to legally force humans out of their habitats on the Moon after 25 years (or indeed after any period) in order to have them comply with the general ban on non-appropriation.

It should also be reiterated that the right of visiting enjoyed by other States and their representatives, even as subject to “reasonable advance notice”,⁴⁴ would serve as an important instrument to help ensure that nothing happens in the settlement which could threaten the prohibition of non-appropriation of the area, and thereby a limitation to any sense of sovereignty possibly creeping in over time.

5. Towards a Solution of the Conundrum?

The solution to the conundrum might well lie in global agreement on the basis of the following twofold approach.

First, it would be desirable (and may perhaps also be politically feasible) to arrive at a consensus that, as long as the existence and continued operation of a particular human settlement complies with applicable limitations such as the above, as well as avoid any *de jure* claims or other *de facto* constraints which could only be justified as part of sovereignty, the primary limitation to permanent occupation would lie in the need to continuously inhabit the settlement, in other words: if a settlement is actually abandoned by humans, after a certain amount of time (say, a few years) any other State may consider the site completely available for its own exercise of freedom of activities on the Moon.

42 The recent practice of replenishing multiple satellite systems or satellites in clustered slots has brought the underlying problem out in the open: would this result in *de facto* assignment of slots or orbits for a time limited only by the interest of the occupant in occupying them?

43 See e.g. § 5.3.2, IADC Space Debris Mitigation Guidelines, IADC-02-01, Revision 1, September 2007; ISO Standard 24113, 6.3.3.

44 Art. XII, Outer Space Treaty (*supra* n. 9).

It is important to also reiterate that such rights are available, in first instance, only to *States*, and only at a second level to non-State actors as long as duly authorized and supervised as well as acting in conformity with applicable international space law, all as per Article VI of the Outer Space Treaty. While the ‘non-appropriation’ principle formally has been addressed to States only, and occasionally efforts have been made to argue that, therefore, *a contrario* non-State actors *could* come to own parts of the Moon, the fallacy of such arguments has been sufficiently repudiated so as not to require being addressed again here.⁴⁵

In the particular context of human habitats, this also means that individual States – even those responsible for a particular settlement – cannot bestow *property rights* over parts of the Moon as such on private sector human habitat developers (as this would *de jure* be only justifiable following the application of precisely the territorial sovereignty forbidden by Article II of the Outer Space Treaty), but merely *authorizations* to establish and operate such habitats, with actual property rights being limited to the constructions erected on the Moon as opposed to the underlying ‘territory’. After all, also Article VIII of the Outer Space Treaty recognizes the continued possibility to exercise ownership rights over space objects launched into outer space,⁴⁶ including if used as (part of) human habitats.

The next question to be tackled would then be to agree under what circumstances such authorizations by one State could be upheld against other States and their private entities, somehow for example along the lines of States mutually recognizing intellectual property rights granted under another State’s national law and jurisdiction.

Though not legally codified yet, it might be expected or at least be convincingly argued that also (parts of) habitats constructed from *in situ* resources (assuming those were exploited in conformity with international law⁴⁷) would give rise to ownership thereof by the (State or non-State) actors

45 See *e.g.* Statement by the IISL Board of Directors on claims to property rights regarding the Moon and other celestial bodies; <https://iislweb.org/statement-by-the-iisl-board-of-directors-on-claims-to-property-rights-regarding-the-moon-and-other-celestial-bodies/> (last accessed 3 November 2020); F.G. von der Dunk, E. Back-Impallomeni, S. Hobe & R.M. Ramirez de Arellano, Surreal estate: addressing the issue of ‘Immovable Property Rights on the Moon’, 20 *Space Policy* (2004), 149-56.

46 In relevant part, Art. VIII, Outer Space Treaty (*supra* n. 9), provides: “Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body”.

47 This refers to the discussion on the legality of ‘space mining’; see *e.g.* F.G. von der Dunk, Asteroid Mining: International and National Legal Aspects”, 26 *Michigan State International Law Review* (2018), esp. 99-101; coming to the conclusion that essentially such exploitation is legal as long as complying with relevant international obligations pursuant to, in particular, the Outer Space Treaty

actually harvesting them, subject to domestic legislation of the State internationally responsible under Article VI of the Outer Space Treaty ensuring both such conformity with international law and a form of ownership title under domestic law *not* premised by the object of ownership being present in the territory of the State at issue.

Second, the further question concerning the extent to which international space law *does* provide for further limitations on the freedom of individual States to establish and operate (or allow the establishment and operation by private actors under their international responsibility of) human settlements has to be satisfactorily addressed. Apart from the few, rather marginal limitations provided by the Outer Space Treaty itself, confined to such general concepts as the avoidance of harmful interference as per Article IX (and for those States parties to the Moon Agreement the additional limitations stemming specifically from such partisanship), it has to be noted that Article III ‘imports’ general international law in general into space law.

General international law, given the major development of international law on the issue as flowing from the UN Charter itself, notably now includes prohibitions on discrimination also of individuals, minorities and peoples in general – not just of States.⁴⁸ States having become responsible (under Article VI of the Outer Space Treaty) for the establishment of long-term human settlements on the Moon should thereby *not* be entitled to exclude without further ado (or allow such exclusion by relevant private operators of) citizens of other States, since that is a prerogative fundamentally linked to territorial sovereignty. In exercising any jurisdiction over habitats on a quasi-territorial basis pursuant to Article VIII of the Outer Space Treaty and/or over the private actors establishing and operating them under Article VI, the relevant States should ensure some sort of a principled right of joining the settlement available to everybody on a non-discriminatory basis.

This does not mean that States would be required to allow (or force private operators to allow) just anyone into a settlement – that would mean a major extension of the right of access already available under Article XII of the Outer Space Treaty to now apply (1) to non-State representatives and (2) beyond mere visits, so as to include actual settlement. The non-discrimination principle first would not exclude the legitimacy of limitations based on such objective or objectivized criteria as availability of ‘space’, commitment to the

(*supra* n. 9).

48 Further to esp. Art. 1(3), Charter of the United Nations (hereafter UN Charter; San Francisco, done 26 June 1945, entered into force 24 October 1945; USTS 993; 24 UST 2225; 59 Stat. 1031; 145 UKTS 805; UKTS 1946 No. 67; Cmd. 6666 & 6711; CTS 1945 No. 7; ATS 1945 No. 1), an extended body of international law has developed basically outlawing the discrimination on the basis of “race, sex, language, or religion”.

settlement's organizational principles and acceptance of the responsible State's quasi-territorial jurisdiction. It would, secondly, not exclude the right to refuse access to those acting without any State's authorization, as Article XII even speaks of "representatives of other States" and Article VI subjugates private space activities in any event under one State or another, requiring those activities to be authorized and supervised by such a State. Note also the specific caveat of reciprocity in allowing access to stations on celestial bodies, which of course can only exist as between States.

At the same time, it would be difficult to justify denying representatives in principle the right to join a settlement for the long term. The details between where the responsible and/or registration State's right to refuse such foreigners to join the settlement gives way to a right of such foreigners to actually live there would obviously need to be hammered out in further detail, which no doubt is a far from easy task. Yet, the resulting possibility of multi-national habitation of a settlement for which only one State qualifies as the originally responsible one under Article VI would be (1) something private operators would in principle be striving for (a commercial company would in first instance not care which nationalities would be on board of relevant settlement missions, as long as they pay) and (2) an exciting manifestation of the principle that the exploration and use of outer space are the province of all mankind, as inclusive as it can be.

And while certainly far from a foregone conclusion, in particular the open and inclusive approach of ESA's Moon Village concept might prove the willingness of at least a number of major spacefaring nations to seriously consider such inclusive settlements on the Moon, ultimately allowing the various original nationalities to fade into the distance and result in a special 'Moonkind'.

