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The peaceful use of outer space: protecting life on Earth

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Abstract

The way we explore and use of outer space is fundamental in terms of the world economy, strategic thinking, terrestrial military strategy, geopolitics, human rights, commercial enterprise, tech innovation and, frankly, the future of humankind. The impact of our use of space and the increasing range of space activities mean that law has an important role in ensuring that such activities are carried out in an appropriate manner. But law is not enough. We need to adjust our mindset about the use of space to recognise its uniqueness and the ‘humanity’ and ‘common interest’ doctrines that underpin it. A claim by some elements of society that space is the new ‘warfighting domain’ contradicts the 6-decade-long understanding that it is a shared area governed by international law, where global interests converge to ensure its exploration and use for the benefit of humanity. The goal of preventing an arms race in outer space (PAROS) is vital and must be continued, yet it still contemplates and may even legitimise increased military uses of space. We need to set our ambitions even higher—a pursuit of a ‘peace race’ in space. Only then can we begin to move towards an even broader aspirational goal of utilising international human rights law to protect humanity for all threats that might emerge from activities taken above us.

Keywords Outer space · PAROS · Peaceful uses · Human rights · Safety, security, stability and sustainability of outer space

Since the dawn of the first ‘Space Age’ in 1957 (Freeland 2021), space-related technologies have transformed our lives, revolutionising communications, medicine, navigation, finance, agriculture and computing, to name but a few. Space is an element of every country’s critical infrastructure and supports the world economy, international trade and investment, strategic thinking, military strategy, national security, science and, frankly, the future of humankind. A (theoretical) ‘day without space’ would be disastrous for lives, livelihoods and economies around the world.

Simply put, space is everywhere in our lives—it is ubiquitous—and it is multifaceted, incorporating the need to listen to many diverse ‘voices’ as we continue to develop governance frameworks to allow us all to garner the benefits from its peaceful use.

The imperative for every country to enhance its sovereign space capabilities creates an interesting ecosystem for increased transfer of technology. Adherence to fundamental principles that promote peaceful uses of space is essential if

we are to avoid a ‘tragedy of the commons’ (Hardin 1968; Freeland 2017) in space and the unbridled negative consequences that would have on Earth. We must continue to enhance a deeper understanding of the common interests of all to act responsibly in space, thus allowing for further benefits to be utilised for the global community whilst avoiding the potential for destructive capabilities being supported by this rapidly developing technology.

In short, for the sake of humanity now and into the future, we need to utilise space technology so as to ‘maximise the benefits for all, whilst minimising the risks’—a simple maxim but one that has dramatic, perhaps even existential, implications for the life on Earth.

Thus, as we witness the ongoing brutality and carnage rendered in the war in Ukraine by, among other things, weapons from ‘the sky’, it is appropriate to reflect also on the significance of ensuring that outer space—the area above airspace—is properly regulated and protected from the development and utilisation of military systems that could also cause devastating damage to humanity on Earth, either directly, or by the destruction of other satellites upon which we are all dependent.

Issues relating to the safety, stability, security and sustainability of outer space are frequently raised in multilateral

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fora such as the Vienna-based United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) and its two subcommittees. An overarching theme in these discussions relates to our future ability to utilise space, and the potential benefits that it may offer to humankind. One very important part of this obligation is to prevent (armed) military conflict from taking place in outer space, as well as the proliferation and placement of space weapons systems. Indeed, these threats represent a very significant challenge to humanity's best interests. To put it bluntly, we must 'defend' ourselves—including our reliance on outer space technology—from *ourselves*.

Since 4 October 1957, when the world's first artificial satellite to orbit the Earth (Sputnik 1) was launched, humankind has respected this element of planetary protection quite well. Looking from this perspective, space has actually 'worked' well, itself quite a remarkable feat of law and the rule of law, and its facilitation of responsible norms of behaviour, given the rapid development of (military) space technology over the past 5 decades. We have not seen a space object destroyed in anger—although several States have deliberately destroyed their own satellites (Paikowsky 2021)—and space has not become a theatre of warfare, notwithstanding more recent calls by some for it to be regarded as a 'war fighting domain', a categorisation that must be resisted and rejected (Freeland 2018).

At the same time, the existing legal regime for space has not prevented the development of technology in outer space that forms part of the military infrastructure of 'terrestrial' armies and is therefore ever more frequently used in terrestrial military conflicts. Whilst there are restrictions on the militarisation of space in the relevant space law treaties—each of which were negotiated, and their terms agreed by consensus through UNCOPUOS discussions—it is sometimes 'convenient' for various sectors to be 'creative' in their interpretation as to what they do (and do not) prohibit.

This is not entirely surprising, since the development of space-related technology was, at least initially, inextricably related to military strength—both in reality, and to influence the perception of others. It is no coincidence, for example, that the first space race emerged at the height of the Cold War, when both the USA and the USSR strove to flex their respective technological 'muscles'. The early stages of human space activity coincided with a period of quite considerable tension, with the possibility of large scale and potentially highly destructive military conflict between the (space) superpowers of the time always lurking in the background.

In this vein, and notwithstanding the undoubted possibilities for humankind that it would present, the successful launch of Sputnik 1 generated unease among many, since the technology used was (is) similar to that for ballistic missiles. In fact, it is clear that space has been utilised for

military activities almost from the commencement of the space age. For some, it is now even within the realms of reality that outer space may itself become an emerging theatre of warfare.

Within this highly sensitive context, it is crucial that efforts have been made by the international community to regulate this frontier to avoid a build-up of weapons in space—in more modern parlance, referred to as the 'Prevention of an Arms Race in Outer Space' (PAROS).

Unfortunately, the situation has, if anything, become significantly more complex in more recent times, with potentially drastic and catastrophic consequences. Just as the major space-faring nations have been undertaking what might be termed 'passive' military activities in outer space, outer space is increasingly now being used as part of active engagement in the conduct of military activities on Earth (Maogoto and Freeland 2007). Not only is information gathered from outer space—through, for example, the use of remote satellite technology and communications and internet satellites—used to plan military engagement on Earth, but space assets are also now used to direct military activity and represent an integral part of the military hardware of the major powers. We increasingly hear, for example, of the use of precision-guided (by GPS satellites) missiles (sometimes referred to as 'smart bombs'), a fearsome extension of the already threatening ICBM systems and other missiles that traverse through space on their trajectory to their ultimate target on Earth.

There are clear rules already that apply to the military uses of outer space (Jakhu and Freeland 2022), but these rules will need further augmenting as the technology continues to evolve and the geopolitics associated with outer space seemingly overrides all the other voices in the room. Yet, the need for a more comprehensive and detailed legal/regulatory framework for outer space represents one of the most politicised and complex challenges ahead for our, and future generations. All stakeholders need to work together to find a path forward, in order to meet the challenges. The existing international regulatory framework, whilst important, cannot alone stand up to the complexities that the ever-increasing range of space activities—and the possibilities that still lie before us—impose.

This gives rise to some important and fundamental questions. How should the societal, community and human impacts of our inexorable march into space be measured? Why has there been so little work done as regards the human rights aspects of the exploration and use of outer space? (although this is now slowly changing) (Freeland and Ireland-Piper 2021, 2022; Freeland and Jakhu 2014; Marboe 2013). What legal and regulatory regimes best protect the broader interests of society on Earth without unduly restricting the development of appropriate space activities in the future? And, indeed, what are the criteria



by which we are to determine the priorities as to what constitutes ‘appropriate’ future space activities?

Furthermore, as we develop frameworks to address these legal challenges, we must always remain aware that our responsibilities in this regard extend not just to ourselves, but to future generations (Hobe et al. 2013). It is incumbent on us, and imperative for the future of humanity, that we do not repeat some of the mistakes we have made on Earth that threaten our ability to coexist here into the very long term.

We are now doing things that were beyond the comprehension of people even 5 years ago, let alone when the foundational space law treaties were agreed. We really do not know what might be possible in even a few years from now. We need to adhere to the fundamental principles of space law, but undoubtedly we need more guidance.

In this regard, law will therefore continue to play a crucial role. But lawyers certainly cannot do this on their own. They simply do not have the tools to do so. All relevant stakeholders must exchange ideas, knowledge and expertise and understand how each can contribute to an appropriate future where space continues to play a vital role in the activities of humankind and does not represent a potential threat to our lives and livelihoods through irresponsible or reckless actions.

For me, there are three overarching principles that we must apply as we continue to meet the challenges and responsibilities. Notwithstanding the ‘terrestrial’ geopolitical tensions, all countries, and particularly the major space-faring nations, have much more in common in space than they have differences—the principle of common interests is very real in the paradigm of space. The major powers’ utilisation of space has allowed them to do incredible things, to grow and develop and maintain competitive advantages over other countries. They have significant space assets as part of the critical infrastructure on which they rely and are therefore highly dependent on space and most vulnerable if certain lines are crossed. It is clearly in all of their interests that the use of space is not compromised by irresponsible behaviour, which would include the use of space to threaten life on Earth.

The second overarching principle is humanity. The future of humanity is linked to space. It is a crucial part of everything we do on Earth now and impacts on everyone’s lives, livelihoods and human rights. We must stay loyal to notions of humanity as we move forward. In the end, the principle of humanity, incorporating also the rights of each person, must be the bedrock of all global legal regimes, including the regulation of the exploration and use of outer space.

My third overarching principle arises from our stewardship relationship not just with the Earth, but also with space. We are custodians of the planet—though we are not doing a great job at that—but also of space, for current and future

generations. There is so much to enjoy and wonder about space and we must ensure that those elements remain.

In my opinion, everything we do in the governance of space should be directed towards responsible behaviour, avoiding conflict and maintaining the stability, safety, security and sustainability of space going forward. The link between a peaceful, secure, safe and sustainable use of outer space and the resulting socio-economic benefits for people on Earth is uncontested. Furthermore, the causal nexus between socio-economic development, incorporating the exploration and use of outer space, and the basic realisation of human rights is also increasingly evident (Freeland 2022; Jamschon Mac Garry and Freeland 2023).

So, in this context, it is certainly plausible to frame an existing positive right for all of us on Earth—the right to safe, secure, stable and sustainable access to and use of outer space. This may represent an important initial element within a broader trend being postulated by some commentators—the possible emergence in the future of a new human right such as that proposed by the Airspace Tribunal to ‘protect the freedom to live without physical or psychological threat from above’ (Grief et al. 2018).

It is important therefore to focus the language of space, and the underlying thinking about the regulation of space, towards activities that enhance capabilities and promote the peaceful uses of space, and away from the rhetoric of space as an area of conflict, military competition and, ultimately, as a domain of warfare. This is not easy—space has become even more geopolitical in nature, and current events highlight that militaries will seek to use any technology that they perceive will advance their cause. Strong voices are required to emphasise the myriad human rights issues at stake. In the end, there cannot be a ‘winner’ of a war in space (Freeland et al. 2020)—and humanity’s existence on Earth will suffer.

We are thus at a crossroads at this moment when it comes to space. If we stray down the wrong path, there may be a point where the destructive consequences in space, and the impacts this will have on Earth, become irreversible. Of course, everybody wants to maximise their own advantage but, in the end, we must continue (or perhaps re-learn) to respect space and recognise its fragility, as well as understand the destructive consequences that certain actions involving space systems can potentially have for all of us. We need to do everything to serve the interests of humanity in the best possible way and accept the fundamental premise that we all have a right to remain safe from, and not be under threat from activities undertaken in outer space.

Whilst continuing to embrace the notion of PAROS—preventing an *arms* race in outer space—we need to go further. Humanity needs urgently to embark on a ‘*Peace Race in Space*’—only then can move towards ensuring that, at the least, humanity can continue to exist without the threat of physical or psychological attack from ‘the heavens’, as an



important starting point to protect us from everything that happens above.

Notes

1. The boundary between airspace (which is within national jurisdiction) and outer space (an area beyond national jurisdiction) has not been internationally agreed—but, for the purposes of this brief discussion, I ask the reader to envisage a delimitation point at 100 kms above mean sea level.
2. For information about UNCOPUOS, see <https://www.unoosa.org/oosa/en/ourwork/copuos/comm-subcomms.html>.
3. The Scientific and Technical Subcommittee (STSC) and the Legal Subcommittee (LSC).
4. The most recent of these was conducted by Russia in late 2021. Previous anti-satellite (ASAT) tests had also been undertaken by the USA, China and India. On 12 December 2022, the United Nations General Assembly (UNGA) adopted (155 in favour, nine against and nine abstentions) Resolution 77/41 titled ‘Destructive direct-ascent anti-satellite missile testing’, which called upon all States to ‘commit not to conduct destructive direct-ascent anti-satellite missile tests’ (paragraph 1).
5. See, in particular, the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies 610 U.N.T.S. 205 (Outer Space Treaty). For details of the other United Nations Space Treaties and governance instruments, see <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html>.
6. See ‘NATO Update—1957’, www.nato.int/docu/update/50-59/1957e.htm.
7. Refer to the numerous UNGA Resolutions, beginning with Resolution 36/97C, (9 December 1981), which have been directed towards the ‘Prevention of an Arms Race in Outer Space’. More recently, the UNGA adopted (115 in favour, seven against and 47 abstentions) Resolution 77/250 (30 December 2022) titled ‘Further practical measures for the prevention of an arms race in outer space’, which called upon all States, in particular those with major space capabilities, to *inter alia* ‘take urgent measures to prevent for all time the placement of weapons in outer space and the threat or use of force in outer space, from space against Earth and from Earth against objects in outer space’ (paragraph 3(a)). See also UNGA Resolution 77/40 (12 December 2022).
8. This obligation is already reflected in Article 4(1) of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement)

1363 UNTS 3, although it must also be noted that there are currently only 18 States Parties to this instrument.

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Steven Freeland is Emeritus Professor at Western Sydney University and Professorial Fellow at Bond University and is also associated with Universities/Institutes in Copenhagen, Vienna, Toulouse, Hong Kong, Montreal, Kuala Lumpur, Vancouver, Mumbai and London. He is a Member of the Australian Space Agency Advisory Board and has advised over 20 governments on issues relating to national space legislative frameworks and policy. He has been appointed by the United Nations Committee on the Peaceful Uses of Outer Space as Vice-Chair of its 5-year ‘Working Group on Legal Aspects of Space Resource Activities’ and has previously been a Visiting Professional at the International Criminal Court. He is a co-Principal of specialised space law firm Azimuth Advisory, a Member of the World Economic Forum Global Future Council on the Future of Space, a Director of the International Institute of Space Law (IISL) (2010–2022) and a Member of the Space Law Committee of the International Law Association. In 2022, he was presented with a ‘Lifetime Achievement Award’ by the IISL, the highest accolade awarded by that institution.

