#Digital-Free National Parks

A 2023 Call for the establishment of Digital-Free National Parks and Space Parks

The 2023 Call and supporting documentation is iterative and does not seek to be a final authoritative work on this topic. The authors do not claim astronomical or satellite expertise and seek correction wherever anomalies or errors are detected. Expert counsel is welcomed in bettering the underlying thesis. Any anomalies or corrections can be sent to info@digitalfreenationalparks.com

Introduction[1]

The history of national parks and their legislative protections has evolved over time, driven by the need to preserve natural landscapes and wildlife for public enjoyment and future generations.

This document is a call for the next evolution in what "national" parks are intended to protect and preserve.

The authors call for timely, proportionate and where appropriate coordinated legislative reform across jurisdictions to found, develop and run Digital-Free National Parks and Space Parks.[2]

A Digital-Free National Park would be an area open to the public where electronic devices and digital connectivity are restricted or prohibited, creating an environment that is free from digital distractions and the potential health benefits to humans, flora and fauna and environmental risks associated with electronic devices and wireless communications.

Digital disconnection is an important aspect of human and biological life that we must preserve, especially in the face of increased digital connectivity.

As technology advances and universal internet coverage progresses, it is crucial to preserve locations on Earth for humans to disconnect.[3]

In order to achieve this, Digital-Free National Parks and corresponding Space Parks will require express legislative protections to secure their creation and ongoing operation.

[1] A number of academics and practitioners across the disciplines of law and astronomy have been involved in the development of the 2023 Call and the concepts contained herein (including its review) – we offer our gratitude for their time and thought.

[2] The 2023 Digital-Free National Park and Space Park Call is not intended to promote that all national parks should be Digital-Free. It is also a call that some form of Space Parks (or at a minimum a space easement) may be a requisite for Digital-Free National Parks.

[3] In the Blueprint for an AI Bill of Rights the White House Office of Science and Technology Policy has identified five principles that have been designed to "guide the design, use, and deployment of automated systems to protect the American public in the age of artificial intelligence". The creation of digital free locations may be a necessary element in achieving the ability to sustain privacy, be protected from unsafe or ineffective systems and perhaps most importantly the ability to "opt out" of automated decisions. The Blueprint sets out that "You should be able to opt out, where appropriate, and have access to a person who can quickly consider and remedy problems you encounter. You should be able to opt out from automated systems in favour of a human alternative, where appropriate. Appropriateness should be determined based on reasonable expectations in a given context and with a focus on ensuring broad accessibility and protecting the public from especially harmful impacts." U.S. Office of Science and Technology Policy, *Blueprint for an AI Bill of Rights: Making Automated Systems Work for the American People* (Oct. 2022), <https://www.whitehouse.gov/ostp/ai-bill-of-rights/> [accessed 2 May 2023].

Thesis

If the thesis is correct that:

1 **digital disconnection** is a human right or at minimum an important human need; and

2 we are moving from external digital connectivity devices to wearable devices, to **implantable** digital connectivity devices; and

3 we are moving to increasingly complex **augmented, virtual and AI** driven realities; and

4 we are moving to a model of comprehensive and **universal global internet coverage** through the deployment of thousands of satellite constellations in Low Earth Orbit (LEO) and increasing large numbers of satellites for communication services in Geostationary Earth Orbit (GEO); and

5 this future state of universal internet coverage will mean that there will ultimately be **no location on Earth** where individuals can **disconnect** from access to, surveillance by, or augmented reality modification without legislative protections that protect or enforce that right.

It then follows that we must at a minimum consider whether new areas or landscapes of disconnection (for example, Digital-Free National Parks coupled with Space Parks) require **express legislative protections** to secure their creation and ongoing operation.

What is a Digital-Free National Park?

A **Digital-Free National Park** or **Space Park** is a protected area on Earth or in space designated and managed by government(s), to preserve areas of natural beauty, ecological value, and, if relevant, cultural heritage by restricting certain activities including digital activities or digital device operation in areas.

“National parks” are established for various purposes, such as conserving biodiversity, protecting unique ecosystems and landscapes, providing recreational opportunities, and promoting environmental education. National parks usually have strict regulations to protect their natural and cultural resources.

These regulations may include restrictions on activities like hunting, logging, mining, and commercial development. Visitor access and activities within national parks are often regulated to minimize their impact on the environment and ensure the long-term preservation of these areas. These same concepts should be extended to apply to certain Space Parks and extended to include digital activity as a prohibited activity in Digital-Free National Parks.

Digital-Free National Parks may require equivalent Space Park areas (set spacial coordinate areas where there are restrictions on satellite type, movement and or use) to successfully operate.

History of National Parks

History to Date

The concept of national parks originated in the United States in the mid-19th century, with the goal of preserving natural landscapes and wildlife for public enjoyment and future generations. The history of national parks and the legislation enacted to secure them can be traced back to several key events and milestones:

Yellowstone National Park (1872)

The establishment of Yellowstone National Park in the United States is widely considered the beginning of the national park movement. Signed into law by President Ulysses S. Grant on March 1, 1872, the Yellowstone National Park Act protected over two million acres of wilderness, creating the world's first national park. This ground-breaking legislation set a precedent for the protection and preservation of natural landscapes on a national scale.[4]

Sequoia and Yosemite National Parks (1890)

Following the success of Yellowstone, additional national parks were created in the United States, including Sequoia and Yosemite in 1890. These parks were established through acts of Congress and signed into law by President Benjamin Harrison, further expanding the scope and reach of the national park system.

National Park Service (1916)

As the number of national parks in the United States grew, the need for a centralized agency to manage and protect these lands became apparent. In response, Congress passed the National Park Service Organic Act on August 25, 1916, creating the National Park Service (**NPS**) as a bureau within the Department of the Interior. The NPS was given the responsibility of managing and preserving national parks, monuments, and other protected areas.

International expansion

Inspired by the success of the U.S. national park system, other countries began to establish their own national parks in the early 20th century. For example, Canada created Banff National Park in 1885, Australia established the Royal National Park in 1879, and Sweden designated nine national parks in 1909. Each country enacted its own legislation to protect and manage these areas, often adapting elements from the U.S. model.

World Conservation Union (IUCN) guidelines (1961)

In an effort to provide a global framework for the establishment and management of protected areas, the International Union for the Conservation of Nature (now the World Conservation Union, or **IUCN**) established guidelines for national parks and other protected areas in 1961. These guidelines have since been updated and refined to provide a comprehensive set of criteria and categories for protected areas worldwide.

4 Australia's first national park, the Royal National Park, was established in 1879, originally named "The National Park". It is located in New South Wales, near Sydney. The park was renamed to "Royal National Park" in 1955.

World Heritage Convention (1972)

The United Nations Educational, Scientific, and Cultural Organization (**UNESCO**) adopted the Convention Concerning the Protection of the World Cultural and Natural Heritage in 1972.

This international treaty encourages countries to identify and protect natural and cultural sites of outstanding universal value, including national parks. Many national parks have since been designated as World Heritage Sites, providing additional recognition and protection under international law.

National Parks now

There are more than 4,000 national parks worldwide[5]. However, the actual number of national parks can vary over time as new parks are designated, existing parks are expanded or reorganized, or protected areas are managed under different designations. National parks are found in nearly every country and cover diverse ecosystems, landscapes, and cultural sites. The number of national parks in each country can range from just a few to several hundred, depending on factors such as the size of the country, the diversity of its natural and cultural resources, and its commitment to conservation.

[5] An additional definitional wrinkle is that many "national parks" are in fact state parks, so any "park" located within state legislative bounds may require coordinated legislative change and policy decisions across one or more states within a national jurisdiction.

Case Study – John Muir

John Muir, a Scottish-American naturalist and conservationist, was a strong advocate for the establishment of national parks in the United States. He believed that preserving natural landscapes and providing access to them was essential for both ecological and human well-being. Muir's advocacy for national parks was driven by the following group of concepts, concepts that can be argued to equally apply to digitally disconnected spaces and to space.

Protection of natural beauty and ecosystems: Muir was passionate about the protection of America's wilderness areas, recognizing the value of their unique landscapes, flora, and fauna. He believed that these areas needed to be preserved from the negative impacts of human development, such as logging, mining, and agriculture. Establishing national parks would ensure the long-term protection of these ecosystems and their biodiversity.

Spiritual and emotional connection with nature: Muir was deeply influenced by his experiences in nature, which he believed had a profound impact on his spiritual and emotional well-being. He saw national parks as a means of providing people with the opportunity to connect with the natural world, escape the stresses of daily life, and experience the restorative power of nature.

Education and inspiration: Muir believed that exposure to the beauty and grandeur of natural landscapes would inspire people to appreciate and respect the natural world. National parks would serve as open-air classrooms, where visitors could learn about the environment, ecology, and the importance of conservation.

Public health and recreation: Muir recognized the value of outdoor recreation for physical and mental health. He advocated for national parks as places where people could engage in outdoor activities like hiking, camping, and exploring, which would contribute to their overall well-being.

Economic benefits: Muir understood that national parks could provide economic benefits through tourism, job creation, and the development of infrastructure in surrounding communities.

John Muir's advocacy for national parks was instrumental in the establishment of the United States' national park system, and his passion for nature and conservation continues to inspire people and the creation of National Parks worldwide. His efforts helped lead to the creation of several national parks, including Yosemite, Sequoia, Mount Rainier, and Grand Canyon.

How does it work?

A Digital-Free National Park would be an area open to the public where electronic devices and digital connectivity are restricted or prohibited, creating an environment that is free from digital distractions and the potential health benefits to humans, flora and fauna and environmental risks associated with electronic devices and wireless communications.

A Digital-Free National Park may operate through **low technical intervention** for example by:

Zoning and signage

The park could be divided into zones, with specific areas designated as Digital-Free. Clear signage and information would be provided to visitors, indicating the boundaries of Digital-Free zones and the rules for using electronic devices within these areas.

Visitor education

Park staff could provide information and guidance to visitors about the purpose and benefits of Digital-Free zones, encouraging them to disconnect from their devices and engage with the natural environment and other park activities.

Device storage

Secure storage facilities could be provided for visitors to temporarily leave their electronic devices while they explore the Digital-Free zones.

A Digital-Free National Park will likely also require **high technical intervention**, for example by:

Restricted connectivity

In acknowledging that while complete digital blackout is now impossible, there is still opportunity to regulate technologies and areas to preserve Digital-Free National Parks to a practical extent.

Wireless networks, such as Wi-Fi and cellular, could be limited or disabled in Digital-Free zones. This might involve working with telecommunications providers to reduce or eliminate coverage in designated areas or deploying signal-blocking technology to prevent wireless communications.

Restricting connectivity will likely be dependent on restrictions on movement or operation of satellite technology (or certain types of satellites), and or by sending commands to the satellite's altitude control and propulsion systems, or "turning-off" satellites in defined orbital spaces. See more on this in Space Parks below.

The preferred method advocated by the 2023 Call is a high technical intervention by appropriate community and accompanied by jurisdiction appropriate forms of low technical intervention.

Potential Benefits

The potential benefits of a Digital-Free National Park may include:

Mental health and well-being
Disconnecting from digital devices can reduce stress, improve concentration, and promote relaxation. A Digital-Free environment encourages visitors to focus on their surroundings, engage in mindful activities, and connect with nature, which has been shown to have positive effects on mental health.

Social interaction
Without digital distractions, visitors may be more inclined to interact with each other and engage in shared experiences, fostering a sense of community and connection within the park.

Wildlife protection
Reducing exposure to anthropogenic noise from digital devices and electromagnetic radiation may have a positive impact on wildlife, as some species are sensitive to these disturbances. Additionally, the absence of drones and other disruptive devices can help minimise disturbances to wildlife habitats and behaviours.

Controlled Studies
Preservation of certain natural analogue only environments will continue to allow for better controlled studies (including of humans, flora and fauna) and remove a digital variable.

Preservation of non-virtual locations
As the line between digital (virtual or augmented) driven reality and traditional reality becomes increasingly blurred, with sometimes dystopian effects, humans may seek time in Digital-Free National Parks to re-anchor in reality.

AI mitigation
Recent advances in artificial intelligence (particularly arising from the combination of generative and narrow AI models) has exposed the low but not illusory risk of negative AI outcomes based on "AI out of the box" scenarios. The reservation of non-digitally connected locations is a measured mitigatory response to this low but potentially catastrophic risk.

Security
Digital-Free National Parks may be considered places of amnesty or sanctuary where there is digital warfare or digital pollution.

Preservation of natural experiences
A Digital-Free environment allows visitors to fully immerse themselves in the natural beauty and tranquillity of the park, creating a more authentic and memorable experience.

Economic impacts
A Digital-Free environment may be an increasingly attractive location for escape from modern life and individuals may pay a premium to tourist in analogue, disconnected areas. Phone-free and digital detox vacation destinations are growing in response to the human desire to disconnect from digital engagement. It is however important to import the democratic notion of access to Digital-Free National Parks as currently seen in the pricing of National Park access to date.

Digital-Free National Parks should not be a preserve of the wealthy.

Potential Risks

There are of course also potential risks and challenges associated with a Digital-Free National Park:

Safety and emergency communications

Restricting or disabling wireless connectivity, or inappropriate restricting or disabling wireless connectivity could make it more difficult for visitors to call for help in case of an emergency. Park authorities would need to implement alternative communication systems and safety measures to ensure that visitors can quickly access assistance when needed.

Alternatively, Digital-Free National Parks could be temporal and have connectivity that could be switched on for example, in cases of emergency. It is inevitable that there will be serious debate on whether Digital-Free National Parks invite crime and nefarious behaviours given their low surveillance potentiality.

A reasonable counterargument to this claim is that many national parks currently have low to no digital connectivity or surveillance but are not "hotbeds" of criminal activity. Most criminal activity takes place in urban areas or cities with concentrated populations. Research has shown that digital crime prevention tools such as CCTV are most effective in car parks and residential settings, and experts recommend against their use in other areas unless it is part of a range of solutions or there is a significant crime issue.[6]

Crime prevention techniques that are not reliant on surveillance technology may be implemented to minimise risks of crime, such as safety-based design, security patrols, and signage. In addition to the many measures available, contact with nature has been shown to reduce precursors to crime such as aggression and stress.

Visitor resistance

If only low technical interventions are prescribed, some visitors might be unwilling to disconnect from their devices or may not fully understand the purpose and benefits of a Digital-Free environment. This could lead to non-compliance with the rules and potential conflicts between park staff and visitors.

Enforcement

If only low technical interventions are prescribed, ensuring that visitors comply with Digital-Free rules may be challenging, as electronic devices are often small and easily concealed. Park authorities would need to develop effective strategies for monitoring and enforcing the rules, which may require additional staff and resources.

Economic impacts

Some visitors may be deterred by the lack of digital connectivity, which could affect park visitation rates and revenue. Park authorities would need to carefully consider the potential economic implications of creating Digital-Free zones and balance these against the anticipated benefits.

Conservation and park management

Some basic level of surveillance (whether localised in the nature of smoke detectors and fire lookouts, or limited satellite or drone surveillance) may be required to adequately deal with bushfires and conservation management.

[6] Piza, Eric & Welsh, Brandon & Farrington, David & Thomas, Amanda. (2019). CCTV surveillance for crime prevention: *A 40-year systematic review with meta-analysis.* Criminology & Public Policy. 18. 135-159. 10.1111/1745-9133.12419.

Space Parks

How would a Space Park work?

A Space Park, as an equivalent of a national park in space, would be a designated area in space or on a celestial body where human activities are regulated to protect and preserve the natural environment, space heritage, and scientific interests.

The concept of areas in space, with restricted connectivity is not new. For many years, radio quiet zones, where radio transmissions and electromagnetic radio are highly regulated or prohibited, have existed in locations around the world to facilitate radio astronomy and other scientific research. Examples include the National Radio Quiet Zone in the United States created in 1958[7], and the Square Kilometre Array Project in Australia and South Africa[8]. General public access is typically restricted to these areas, a gap which a Digital-Free National Park could fill. These areas also control only ground-based frequency emission, not emissions emanating from LEO.

The Space Park concept could preserve the "night sky from the brightness and radio-frequency interference of satellites" as called for by the International Astronomical Union Centre for the Protection of the Dark and Quiet Sky[9]. Consideration could also be given to the forced de-orbiting of satellites in LEO after a limited time and to require objects in LEO to not drift into random orbits, potentially requiring all new objects launched into space to have some active propulsion.

At a minimum, if satellite intrusion into Space Parks is considered critically necessary, or commercially impossible to avoid, Satellites can be "turned off" via ground station communications sent to the satellite using a specific frequency and communication protocol as well as the satellite's control systems and encryption keys.

[7] "National Radio Quiet Zone." in West Virginia Explorer, 2021,<https://wvexplorer.com/communities/regions/national-radio-quiet-zone/>; [accessed 24 April 2023].
[8] "Construction." in SKAO, <https://www.skao.int/en>; [accessed 24 April 2023].
[9] "Construction." in SKAO, <https://www.skao.int/en>; [accessed 24 April 2023].

Notable Satellite Projects

The private sector's growing interest in space has led to an uptick in the deployment of satellite constellations for various purposes, including global internet coverage. Some of the most notable projects include:

Starlink by SpaceX

SpaceX's Starlink is one of the most prominent satellite internet projects currently in development. The company plans to deploy a constellation of around 12,000 satellites (with potential expansion to 42,000) to provide global internet coverage. As of the beginning of 2023, SpaceX has already launched over 4,100 Starlink satellites (though the number of still operational satellites is less), and the service is in its beta testing phase in multiple countries.

Project Kuiper by Amazon

Amazon's Project Kuiper aims to deploy over 3,200 satellites in LEO to provide high-speed, low-latency internet access to unserved and underserved communities globally. The project is still in its early stages, with regulatory approvals being obtained and satellite designs being finalized.

OneWeb

OneWeb is another company working on a satellite constellation for global internet coverage. The Phase 2 constellation consists of 6,372 satellites in LEO (after its original proposal of nearly 48,000) to provide high-speed connectivity to remote regions. OneWeb has deployed 618 satellites in orbit to date.

Telesat Lightspeed

Telesat, a Canadian satellite communications company, is developing the Telesat Lightspeed project, which aims to launch a constellation of 298 LEO satellites. The project's focus is on providing high-speed broadband connectivity to commercial and government users.

These satellite constellations, along with other smaller-scale projects, are expected to significantly expand global internet coverage over the coming years. However, they also face challenges in terms of cost, regulatory approvals, space debris management, and potential interference with astronomical observations. As these projects continue to develop, they will need to address these challenges to ensure the successful and responsible expansion of global internet coverage.

Private Companies in Space

No private company has been prosecuted specifically for leaving space junk in orbit. However, there have been instances where companies or organizations have faced fines or penalties for other violations related to satellite launches or operations, which may indirectly contribute to the problem of space debris. One of the main challenges with prosecuting entities for creating space debris is that international space law primarily addresses the responsibilities and liabilities of nation-states, rather than private companies.

Under the Outer Space Treaty (1967) and the Liability Convention (1972), **countries are responsible for the activities of both their governmental and non-governmental entities in space**, including any damage caused by their space objects. In practice, this means that the responsibility for managing and mitigating space debris falls on the countries that authorize and supervise satellite launches and operations.

Many countries have established national space laws and regulations that govern the activities of private companies in the space sector, including requirements for debris mitigation and end-of-life disposal plans for satellites. There is growing awareness and concern about the problem, and international efforts are underway to develop guidelines and best practices for space debris mitigation.

The Inter-Agency Space Debris Coordination Committee (**IADC**) and the United Nations Committee on the Peaceful Uses of Outer Space (**COPUOS**) have published guidelines and recommendations aimed at reducing the creation of new debris and minimizing the risks associated with existing debris. In the future, as space activities continue to expand and the issue of space debris becomes more critical, it is possible that national and international regulations will evolve to more directly address the responsibilities and liabilities of private companies with regard to space debris.

Practical Satellite Considerations

In furthering the concept of Space Parks as zones where satellite activity might be restricted or limited, we can further investigate what is practically possible by considering the current distinction between what we call:

Passive Satellite Communications (PSC)

These are Earth observation satellites that take photos at various frequencies. They only receive electromagnetic radiation from Earth and do not transmit except when downloading (perhaps once a day over a specific site);

Active Satellite Communications (ASC)

Active satellites that transmit signals continuously to a wide area on Earth, serving as beacons or broadcasting signals. A prime example is the Global Positioning System (**GPS**) satellite network. GPS satellites emit signals that devices on Earth can intercept and use to determine their location through triangulation. Geostationary TV satellites also fall into this category, as they broadcast television signals over a large area, reaching millions of viewers; and

Interactive Satellite Communications (ISC)

Interactive satellites that facilitate two-way communication between Earth and the satellite, allowing for real-time data exchange. An example is the network of LEO satellites providing global internet access. These satellites receive and transmit signals to and from devices on Earth, enabling users to access the internet, send messages, or make voice calls. Interactive satellite communication systems can also include those used for remote sensing, research, or military purposes, where real-time data transmission is crucial.

PSC and ASC communications might be permitted within Space Parks. ISC, on the other hand, could be more strictly regulated, particularly if it involves two-way communications that might compromise the park's intended purpose.

Notwithstanding having made these distinctions between PSC, ASC and ISC, in the future, space communications are moving from radio waves which spray wide and far, to free-space optical communication (directional lasers) (**FSO**). FSO is more secure and increases bandwidth (allowing for example, live video streaming from space).

The increasing use and transition (without the indiscrete scattering of radio communications) to FSO could be beneficial in the creation and use of Space Parks, by reducing electromagnetic interference (**EMI**) and reducing the environmental impact of digital transmissions in space. FSO systems use light, typically in the form of lasers, to transmit data wirelessly through the atmosphere or outer space, rather than relying on radio frequency (**RF**) communication systems.

We now turn to exploring the concept, potential implementation, benefits, and risks associated with such a designation.

Implementation of a Space Park

Defining boundaries

A Space Park would require clearly defined boundaries within space or on a celestial body. This could involve identifying areas with unique environmental, cultural, or scientific value, such as specific regions on the Moon, Mars, or areas around Earth without significant space debris or satellite concentration.[10]

Defining boundaries for satellite exclusion (type of satellite exclusion) or satellite restrictions in Space Parks may assist in creating create a mirroring of Space Parks and Digital-Free National Parks that would be mutually supporting (see further below).

International agreements: Creating a Space Park would likely necessitate the development of new international agreements or amendments to existing space law, such as the Outer Space Treaty (see further below). This would establish rules for the preservation, access, and management of the Space Park and its resources.

Management and enforcement: A governing body or cooperative effort between multiple nations (and potentially states) would be necessary to manage the Space Park, monitor activities within its boundaries, and enforce regulations.

Access and visitation: Rules for accessing the Space Park would need to be established, potentially including permits or licences for various activities, such as scientific research, space tourism, or resource extraction

[10] Satellites move and are controlled in space through a combination of their initial launch trajectory, orbital mechanics, and onboard propulsion systems. Ground control can reorient a satellite's trajectory by sending commands to the satellite's altitude control and propulsion systems. The launch vehicle (rocket) places the satellite into a specific orbit based on the mission requirements. This initial trajectory determines the satellite's path around the Earth. Once in orbit, a satellite's motion is primarily governed by Earth's gravity and other forces such as atmospheric drag (for low Earth orbit satellites) and solar radiation pressure. These forces dictate the satellite's trajectory and maintain its orbit without the need for constant propulsion. A satellite's orientation (altitude) in space is controlled by its altitude control system (ACS). The ACS uses devices such as reaction wheels, thrusters, or magnetic torquers to apply torque and change the satellite's orientation. Ground control can send commands to the ACS to point the satellite's sensors or communication equipment in specific directions. To reorient a satellite's trajectory, ground control can send commands to the onboard propulsion system. The propulsion system typically consists of thrusters that use chemical or electric propulsion. By firing the thrusters in a specific sequence and duration, the satellite's orbit can be changed. This process is called an orbital manoeuvre. To perform these tasks, ground control uses a coordinate system called the Earth-centred inertial (ECI) frame, which is fixed with respect to the stars and centred at Earth's centre of mass. Using this coordinate system, ground control can calculate the satellite's position, velocity, and required manoeuvres to achieve a desired trajectory or orientation.

Benefits of Space Parks

Environmental preservation

A Space Park could help protect fragile environments and ecosystems in space and on celestial bodies from potential harm caused by human activities, such as contamination, resource exploitation, or habitat destruction. Space Parks may also be suitable zones for dark sky preservation, astro-tourism and public enjoyment of starry nights and a nocturnal environment[11]. One of the key concerns of radio astronomers is that humans will not be able to observe the universe from the Earth if digital transmissions become ubiquitous.

Scientific research

A Space Park could provide a pristine environment for scientific research, enabling scientists to study celestial bodies, space environment, and other phenomena without interference from human activities. A related problem facing astronomers is the negative impact on observational astronomy arising from the reflection of fleets of broadband internet satellites[12].

Cultural and historical preservation

A Space Park could help protect sites of historical or cultural significance in space, such as the Apollo landing sites on the Moon, preserving these locations for future generations.

Space tourism and education

A Space Park could serve as a destination for space tourism, promoting public interest in space exploration and providing educational opportunities for visitors to learn about the space environment, celestial bodies, and space history.

[11] "International Dark Sky Association." in International Dark-Sky Association,2020, <https://www.darksky.org/>; [accessed 24 April 2023].

[12] Current solutions include "black satellites" to reduce the manmade "mega constellation" threat to astronomy. A Witze, "SpaceX tests black satellite to reduce 'mega constellation' threat to astronomy." in Nature News, Nature Publishing Group, 2020, <https://www.nature.com/articles/d41586-020-00041-4> [accessed 24 April 2023].

Risks and Challenges

Enforcement and jurisdiction

Enforcing regulations in a Space Park would be challenging due to the vast distances and technical complexities involved in space travel and monitoring. Jurisdictional issues could also arise, as space is considered the "province of all mankind[13]," and no nation can claim sovereignty over celestial bodies.

Access and equity

A Space Park could raise concerns about equitable access to space resources and the potential for certain nations or entities to monopolize areas of interest. International agreements would need to ensure fair access and benefit-sharing for all countries.

Costs and resources

Establishing and maintaining a Space Park would require significant financial and technical resources, as well as international cooperation. Balancing these investments with other priorities, such as terrestrial environmental conservation and social programs, could be a challenge for governments and organizations involved.

Technological limitations

Current space travel and exploration capabilities are limited, which could hinder the establishment, management, and accessibility of a Space Park. Technological advancements would be necessary to make a Space Park feasible and sustainable. As discussed above, the different categories of satellite communications also pose different issues for Space Parks. As discussed above, active satellite communications such as GPS satellites or Geostationary TV Satellites spray weak radio waves widely across Earth, which poses difficulty for Digital-Free areas. The rise of directional lasers is seeing satellite communications move away from wide-spraying radio waves. FSO has higher bandwidth than traditional modes of satellite communication and is also more secure. Regulations protecting Space Parks could potentially be incorporated into existing restrictions on LSO.

Overall, the concept of a Space Park presents both benefits and challenges. While it could play a vital role in preserving unique environments and promoting scientific research, its implementation would require significant international cooperation, resources, and technological advancements.

[13] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Article 1. Robert Wickramatunga, “United NationsOffice for Outer Space Affairs.” in Outer Space Treaty,<https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/outerspacetreaty.html>; [accessed 24 April 2023].

Current Space Restrictions

Current Satellite Expansion

Several companies and organizations are working on ambitious projects to expand global internet coverage through satellite constellations. These plans involve deploying thousands of satellites in LEO to provide high-speed internet access to remote areas and underserved populations worldwide.

This generally well-meaning ambition to improve global access to the internet has meant that few people are yet considering or working on the increasingly important question of access to disconnection globally.

Current Restrictions on Nation States Satellite Activities in Space

There are international treaties and national laws that address various aspects of satellite activities, including their registration, liability for damages, and frequency allocation. Some of the key international treaties and agreements related to satellites include:

Outer Space Treaty (1967)

Formally known as the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, this treaty sets the foundation for space law. It establishes principles such as the peaceful use of outer space, non-appropriation of celestial bodies, and state responsibility for national space activities (discussed further below).

Rescue Agreement (1968)

The Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space requires countries to assist in the rescue and return of astronauts and space objects in case of accidents, emergencies, or distress.

Liability Convention (1972)

The Convention on International Liability for Damage Caused by Space Objects addresses the issue of liability for damage caused by space objects, including satellites. It establishes that launching states are internationally liable for damage caused by their space objects on the Earth's surface, in the air, or in outer space.

Registration Convention (1975)

The Convention on Registration of Objects Launched into Outer Space requires countries to register their space objects with the United Nations and maintain a national registry. This helps to identify and track objects in space and ensures transparency and accountability.

In addition to these international treaties, the International Telecommunication Union (**ITU**)[14] plays a crucial role in managing the

[14] The ITU is a specialized agency of the United Nations responsible for regulating and coordinating the use of telecommunication networks and services, including radio frequency spectrum and satellite orbits. The ITU applies to its member states, which are countries that have joined the organization and agreed to comply with its rules, regulations, and recommendations. As of September 2021, the ITU has 193 member states, covering almost every country in the world. In addition to the member states, the ITU also cooperates with various stakeholders, such as private companies, international organizations, and non-governmental organizations (**NGOs**) involved in the telecommunication and information and communication technology (**ICT**) sectors. These stakeholders can participate in ITU activities as sector members, associates, or academia.

allocation of radio frequencies and orbital slots for satellites. The ITU ensures that satellite communications do not interfere with each other and follow internationally agreed-upon standards.

National laws also regulate satellite activities within individual countries, providing more specific rules and regulations that complement international treaties. These laws cover a wide range of issues, including licensing, insurance, and safety requirements for satellite launches[15].

If a country or entity violates international treaties or national laws related to satellites, the consequences depend on the nature of the violation and the agreements in place between the involved parties. Penalties can range from diplomatic negotiations and reparations for damages to economic sanctions or suspension of cooperation in space activities. In some cases, disputes can be taken to international courts or arbitration bodies for resolution. Compliance with space law is essential to maintaining peaceful relations and fostering international cooperation in space activities.

Current restrictions on private companies in space

There are no specific areas in space where private companies are explicitly prohibited from going, but their activities are also indirectly subject to the Outer Space Treaty. Key principles of the Outer Space Treaty that can indirectly affect private companies' activities in space include:

Peaceful use of outer space

The treaty requires that the exploration and use of outer space be conducted for peaceful purposes. This means that private companies cannot engage in activities that involve the deployment of weapons of mass destruction or the militarization of celestial bodies.

Non-appropriation of celestial bodies

The treaty establishes that outer space and celestial bodies are the province of all mankind and cannot be subject to national appropriation or sovereignty claims. This means that private companies cannot claim ownership of or exclusive rights to celestial bodies, such as the Moon or asteroids.

State responsibility and supervision

The treaty makes nation-states responsible for the activities of their governmental and non-governmental entities in outer space, including private companies. This means that countries must authorize and supervise the space activities of private companies within their jurisdiction to ensure compliance with the treaty and other international obligations.

Liability for damages

Under the treaty and the Liability Convention, nation-states are liable for any damage caused

The ITU's work is primarily carried out through three main sectors:

(1) Radiocommunication Sector (**ITU-R**): This sector manages the global radio frequency spectrum and satellite orbits, ensuring that telecommunication services can operate efficiently and without interference.

(2) Telecommunication Standardization Sector (**ITU-T**): This sector develops international standards (known as ITU-T Recommendations) for telecommunication networks and services, promoting interoperability and the seamless interconnection of networks and devices.

(3) Telecommunication Development Sector (**ITU-D**): This sector focuses on fostering the growth and development of telecommunication infrastructure and services in developing countries, promoting digital inclusion and bridging the digital divide. The ITU's rules, regulations, and recommendations apply to its member states, which are responsible for implementing and enforcing them within their respective territories. This includes managing the use of radio frequencies and satellite orbits by governmental and non-governmental entities, such as private companies, in accordance with ITU requirements.

[15] In review: space law, regulation and policy in Australia, https://www.lexology.com/library/detail.aspx?g=29a0fde0-b441-4d49-858d-f7b5759fd050

by their space objects, including those operated by private companies. This means that private companies may be subject to national regulations and requirements related to insurance, safety, and debris mitigation to minimize potential liabilities.

In addition to these general principles, as with national states, private companies' activities in space may also be subject to the ITU Radio Regulations[16].

Legal Changes

The 2023 Call for the establishment of Digital-Free National Parks and Space Parks also calls for any necessary variations to those international treaties set out above and any national law to regulate satellite and other digital activities in Space Parks and to assist (specifically via any necessary restrictions required in satellite movement or operation) in the creation and operation of Digital-Free National Parks.

[16] See https://www.itu.int/pub/R-REG-RR

For more information visit www.digitalfreenationalparks.com or reach out to info@digitalfreenationalparks.com