



Space Debris: How is Liability Determined and What are the Measures Under International Law to Tackle It?

- Avantika Patra (I B.B.A.LL.B.)

The Outer Space Treaty of 1967, which establishes outer space and the moon to be “the province of all mankind” and free for exploration without a permit, relinquishes responsibility upon nations to keep it clean. However, delving into an extensive analysis of the same reflects the constraints on sovereignty. Concurrently, the treaty expounds a principle that the use of outer space and beyond should be conducted in a way that gives “due regard to the corresponding interests of all other State parties.” Article IX puts the duty upon States to abstain from harmful space contamination and ensure such extraterrestrial matter does not vitiate Earth’s surface. Technically, debris entails deleterious effects and its long-term presence causes national appropriation, neither benefiting mankind nor facilitating the interests of all States, hence violating the Outer Space Treaty. The Space Debris Mitigation Guidelines of “The United Nations Committee on Peaceful Uses of

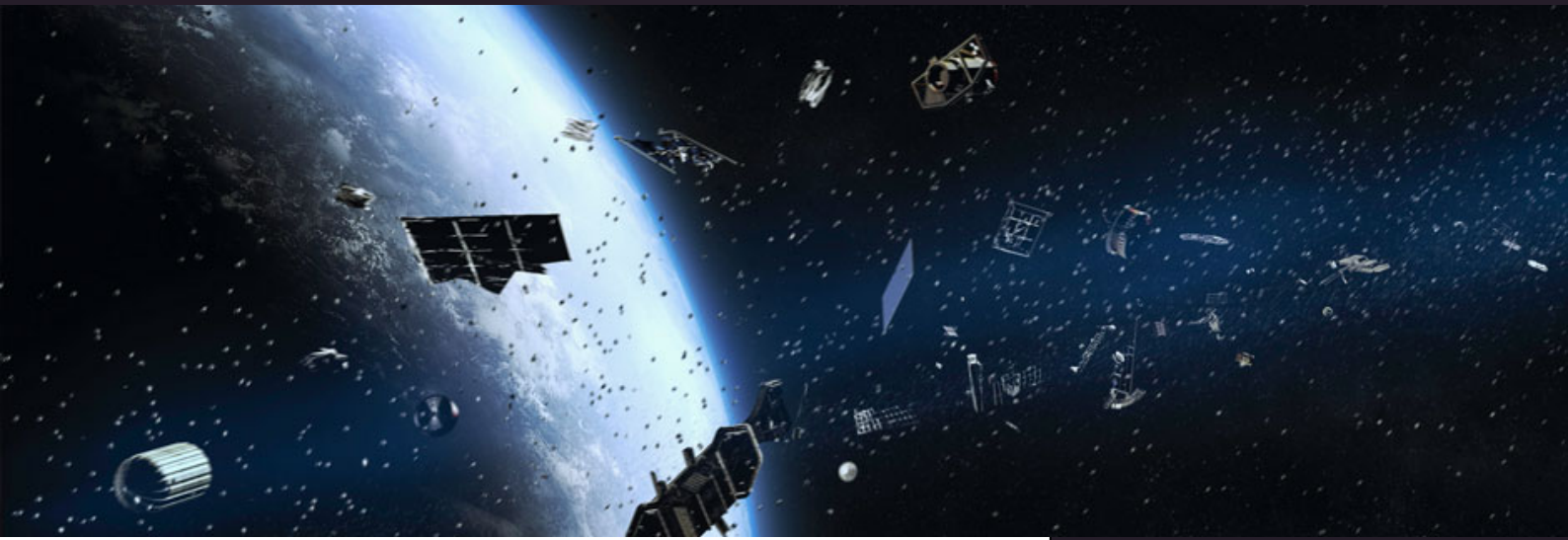
Outer Space (UNCOPUOS)” defines space debris as “all man-made objects, including fragments and elements thereof, in Earth orbit or re-entering the atmosphere, that are non-functional.” Endorsed by the UN General Assembly in 2007 and adopted by UNOOSA (United Nations Office for Outer Space Affairs), it is a compendium of guidelines concisely outlining the global standards on the subject, compiled by UNOOSA. Though not binding, in due course of time, these guidelines have emerged into Customary International Law. Its essence echoes in domestic frameworks of numerous countries, the most prominent being the definition of space debris.

This debris, slightly larger than 1 mm, travels at a speed approximately 10 times faster than a bullet, at this rate even collision of a microscopic piece (like a fleck of paint) and space objects can wreak havoc, which additionally gives rise to Kessler Syndrome that triggers a cascade where a collision leads to continuous debris proliferation, generating extensive debris fields and blocking orbits. Space debris has established a ubiquitous presence in the Lower Earth Orbit, but its expansion at

News at a Glance

Belgium’s Prime Minister announced in a press conference that Belgium has opened an investigation into alleged Russian interference in the upcoming EU parliamentary elections. On the EU level, he stated that the EU needs new tools to “fight Russian propaganda and disinformation.” According to him, one of the steps that needs to be taken to address foreign interference is to reexamine the mandates of the members of the European Public Prosecutor’s Office and the mandates of the European Anti-Fraud Office (OLAF). For more information, see [here](#).

The UN Human Rights Council adopted resolutions to call on UN member states to refrain from supplying jet fuel to the Myanmar military. The council also extended the mandates of the Special Rapporteur on the situation of human rights in Iran and Myanmar and the independent international fact-finding mission on Iran. For more information, see [here](#).



the current rate prompts more material damage to Earth's surface and atmosphere. Debris discharged from Chinese Long March 5B struck villages in Ivory Coast, SpaceX debris was discovered in the Snowy Mountains of Australia, and an orbital collision between a Russian military satellite and a US-based private communication satellite, where one from the US was functional, are some notable events in recent times. Currently, major binding laws or conventions in this sphere are The Outer Space Treaty of 1967, The Space Liability Convention of 1972 and the Registry Convention of 1962.

Debris can pose profound risks to the operations of space satellites, astronauts, and the International Space Station. Ascertaining ownership of objects causing space debris is an arduous task, more so when it comes to tackling millions of small pieces. Experts suggest the formulation of a new precisely articulated law facilitating the determination of space debris ownership encompassing even the tiniest speck. This aspect, to some extent, is embedded in the Registry Convention, necessitating launching States to register space

objects with details regarding their location, duration till which they stay functional, etc. The launching State possesses liability of such objects, even after the manoeuvre ends and the object enters outer space or returns to Earth. Concurrently, it imposes liability on such a State in the event of any devastation caused by the object.

Thus, there are strategies to deduce ownership under this convention. Further, the inclusion of space debris under the term "Space Object" under Article I (d) of the Space Liability Convention has been implied by experts. Nations deploying techniques for debris clean-up may demand extending ownership to minuscule pieces, which are predominantly untraceable. Though unfeasible to establish ownership of such pieces, a hostile nation with its plausible proclamation may trigger global tension. The Space Liability Convention, under Article II, imposes absolute liability upon launching States, whereas Article III provides for fault-based liability where only after the establishment of the fault of States will they be held liable, the onus of elucidating the 'fault' or 'intention' clearly lying on launching State. Article IV of the

News at a Glance

The International Court of Justice (ICJ) announced that Mexico had initiated proceedings seeking provisional measures against Ecuador over Ecuadorian authorities' forcible entry into the Mexican embassy in Quito earlier this month. According to the press release, the dispute is related to "legal questions concerning the settlement of international disputes by peaceful means and diplomatic relations, and the inviolability of a diplomatic mission." For more information, see here.

The UN High Commissioner for Refugees (UNHCR) said over 8.5 million Sudanese have been forced to flee their homes in Sudan since April 2023, when the internal armed conflict began. Among the displaced, 1.8 million fled across the border to South Sudan, Chad, Central African Republic, Egypt, Ethiopia and Uganda. For more information, see here.



Convention tackles the issue of joint liability deciding the quantum of liability where multiple States are involved in damaging the property of a third State. However, this convention specifies different liability standards, essentially to safeguard private citizens. It was applied once during the Kosmos 954 Crash, where the USSR's Reconnaissance Satellite crashed in Canada. Here, Canada refused the USSR's aid and accepted US assistance. They billed a compensation of 6 million Canadian Dollars, however, the USSR only paid 3 million and the matter was settled outside of the convention. The convention stipulates an elusive definition of space objects leaving room for ambiguity. Over the years, it has not had any claims under it; it may be assumed that though the convention lays down comprehensive levels of liabilities, it does not furnish a platform or mechanism to recoup the damages that have occurred. There is also an absence of specifications to reduce massive debris proliferation.

Further shedding some light on a few other laws which are violated by the presence of these derelict objects in space are the International Telecommunication Union (ITU) Convention and the

World Radio Administrative Conference, both of which forbid interference of nonfunctional objects in the radio frequencies. The ITU demands safeguarding of its radio frequencies in order to attain its goals in space, so the interference of any non-functional objects in its frequencies yields liability on States and is "deemed faulty, negligent or abusive."

The theory of market share liability propounded by many, states that the degree of responsibility is apportioned with respect to the contribution of risk, without necessarily identifying small debris. Its stance is that space-faring nations like the US, China, Russia, etc could deploy their advanced technology to aid in debris cleanup. This may escalate their expenses, but they will be incentivized fair and square by making the states responsible for reparation. It is a viable way out since the space programs of these nations are hindered due to incessant debris. "Data from UN Records, Registry Convention, Data Sampling and other records of space collisions" are some techniques to ascertain compensation. Debris violates the Outer Space Treaty's principle of using space resources for collective

News at a Glance

The General Court of the EU revoked the restrictive measures imposed on Mikhail Fridman and Petr Aven, two Russian billionaires, between February 2022 and March 2023. The two were originally sanctioned in connection with Russia's ongoing war in Ukraine. Both are significant shareholders of Alfa Group, a cooperation that includes Alfa Bank, one of Russia's major financial institutions. They are under EU sanctions following the Russian invasion of Ukraine in February 2022. For more information, see [here](#).

The UN Human Rights Council adopted Draft resolution A/HRC/55/L.30, reiterating the call for an immediate ceasefire in Gaza and further calling for embargos and prevention of the supply of weapons to Israel by Member States. Member States voted with 28 votes in favor, six against and 13 abstentions. For more information, see [here](#).



good, so it is prudent to hold major stakeholders liable. The final decision on liability shall be arrived at the UN Secretary General's Office. This regulatory regime is either embedded in "existing law or shaped into a new law, either way," it would allocate funds to those involved in cleaning operations. If this regime is crystallised into Customary International Law, it would devise a binding obligation on the part of States to discharge their duties and responsibilities efficiently.

There is a dire need for streamlining pre-existing legal regimes with space debris being the focal point. Space-faring nations have started to implement all-inclusive frameworks to address the issue, the US' Federal Aviation Administration's "Orbital Debris Mitigation Standards," Germany's Aerospace agency DLR gives significant importance to debris management, Japan's JAXA formulates similar guidelines which put forth concrete mechanisms for avoiding orbital collision, lower rate of debris escalation, once satellite life ends, it provides for safe recovery of non-functional parts keeping in mind aspects of environmental sustainability. These national

frameworks seem to be equipped with changing times and technology, thus the international regime too should be reformed in order to maintain a sustainable environment and stable international relations.

Syzygy Yet in Outer Space?

Understanding the Situation of Antitrust Laws with Government and Private Entities as Stakeholders

- Anuradha Lawankar (II B.A.LL.B.)

We often view the 'space' with childlike wonder, maybe because of its expansive nature that challenges us to broaden our imagination to endless possibilities. But the once enigmatic 'space' has become more accessible to all. Initially, states had greater control over space exploration programmes but today it has become a multi-stakeholder arena. It is witnessing a rapid influx of private actors eager to capitalize on the commercial opportunities present in the 'outer space'. This surge in commercialization creates myriad legal complexities that challenge the existence and adequacy of the present legal mechanism. With more countries participating in space exploration,

News at a Glance

The European Court of Human Rights (ECHR) ruled that Switzerland violated its human rights obligations by failing to adequately address the impacts of climate change, following a complaint brought by a group of elderly women activists. In a majority vote of 16 to one, the Grand Chamber of the ECHR found that Switzerland had breached Article 8 of the European Convention on Human Rights (Convention), which guarantees the right to respect for private and family life. For more information, see [here](#).

Iran launched hundreds of drones and missiles against Israel, in an unprecedented attack that came as a response to an Israeli raid on the Iranian consulate in Syria two weeks ago. The overnight escalation came more than six months into Israel's devastating war on the Gaza Strip, which has killed more than 33,000 Palestinians. For more information, see [here](#).



one must inquire into the anti-competitive and monopolistic practices in space.

Space Law is also known as corpus juris spatialis, which applies to governmental entities. The 1967 Outer Space Treaty (OST) is an essential instrument under international space law. It establishes the fundamental principle that outer space should remain open for exploration and peaceful use by all States. Other such instruments include the 1968 Salvage and Return Treaty, the 1972 Liability Convention, the 1976 Registration Convention, and the 1979 Moon Agreement. An early commentary by Oscar Schachter promoted the concept of viewing space as the "Common Heritage of Mankind (CHOM)," emphasizing the need for shared principles that transcend national interests to ensure security and sustenance.

Commercialization of Space has always been a subject of divergent national laws that fragment the international body of space law. It is usually partaken by States to protect domestic geopolitical and commercial interests. One of the main impediments to consensus is the dearth of a space property rights regime. There is no

definition of a "celestial body," "movable" or "immovable" goods in space, nor is there any universally adopted legal definition of a "space object" or "space resources."

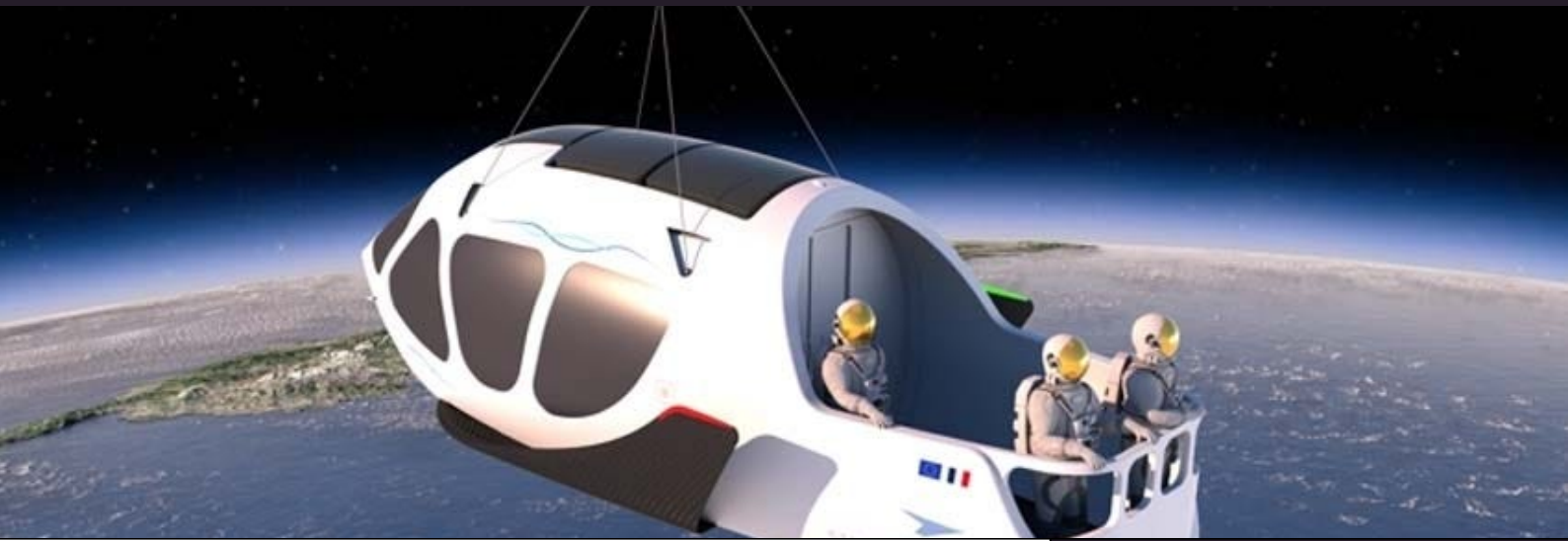
The private sector is stealth to seize this void, by creating a "customary" practice of commercial appropriation of space resources. This phenomenon can be described as the rise of the "lex mercatoria spatialis" (or commercial space law), which is contrary to the corpus juris spatialis. The former is more flexible and elusive given that it is not international, but transnational. Transnational law is more flexible and multifaceted, it is therefore harder to grasp. For example, with regard to property rights, it is difficult to harmonize at an international level as it is linked with national jurisdiction. As soon as some property rights are transformed into financial assets, they escape a given jurisdiction and fall under transnational law.

Anti-monopoly law can be studied at two levels: the what and the how. The what consists of the value proposition of ethical space commerce, compliant with fair competition principles, and the how consists of the means to

Upcoming Activities

Call for Papers: Oxford Workshop in Honour of Judge Theodor Meron

The Oxford University Faculty of Law, All Souls College, and Trinity College will host a workshop on 21 June 2024 in honor of Judge Theodor Meron, Visiting Professor of International Law at the University of Oxford and Honorary Fellow of Trinity College, Oxford. The workshop is for early career researchers, including doctoral students and independent researchers, working on topics and themes addressed by Judge Meron in his career as a lawyer, academic, and judge. These topics and themes may include, amongst others, issues relating to sources of international law, notably treaties and custom, international humanitarian law and international criminal law, human rights law, international institutional law, and literature and law, as well as questions relating to the international judicial function. For more information, see here.



ensure that those means do not monopolize the final frontier. First, there is a situation of natural monopolies and second, there are potential problems antitrust laws cause in high innovation fields.

A natural monopoly occurs when there is a lone provider for a particular good, essentially high fixed costs and low variable costs can cause these phenomena. States encounter high costs of initial research to even enter into the market of space exploration. These include high investments in shuttles, rockets, and high-tech machinery. Additionally, markets with high development costs are potentially compounded in a high innovation market. However, the field of space exploration still faces significant 'barriers to entry' for new entrants, especially the private ones.

Countries should make serious efforts to ensure that antitrust laws are being used as a way to protect incentives rather than becoming a sinkhole for funds that could be better utilized elsewhere. Most important in this changing landscape is the potential for government legal innovation. The country that first develops effective antitrust measures for private

space companies may find itself "the global leader and model for antitrust efforts. An important aspect of that legal innovation will be global cooperation. As companies find more cooperation internationally, countries will benefit from not only expanding the reach of their antitrust laws but more so from an expansion of international antitrust law. The establishment of comprehensive and harmonized international antitrust standards will not only ensure a level playing field but also foster greater innovation and investment in the space industry.

A New Era of Exploration: Updating Space Laws for Space Tourism

- Vishwajeet Deshmukh (V B.A.LL.B.)

What was once confined to the realm of science fiction is now a tangible reality: space tourism, that is, the activity of travelling into space for pleasure and interest, rather than for a job. Companies like Virgin Galactic, SpaceX, and Blue Origin have started launching customers into space. The short flight experiences offered by these companies are only the beginning. Soon, companies may provide

Upcoming Activities

Call for Papers: Western Sahara Research Group – Third Annual Conference

The Third Annual Conference of the Western Sahara Research Group is sponsored by the Centre for European and International Legal Affairs and will be held on 11 September 2024 at Queen Mary, University of London. This event will be organized via several thematic panels to interrogate Western Sahara's international status and its significance from the vantage points of public international law and the law and policy of the European Union. For more information, see here.



opportunities to visit the moon, Mars, and other celestial bodies in our solar system as the technology becomes cheaper. This has opened up an activity that was once reserved for astronauts. There are vulnerabilities and lacunae in existing international laws which deal with space tourism.

Existing space laws originally regulated State activities, bypassing the space tourism sector started by private companies. The treaties that regulate space travel were drafted before the arrival of commercial space tourism, signifying the outdated nature of space laws. There is an urgent need to reevaluate laws to suit the unique and dynamic nature of space tourism.

The UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS) is a multilateral body governing international space law. The first agreement, the Outer Space Treaty (OST) of 1967, ratified by 112 States, is the basis for subsequent agreements. Under the OST, astronauts are considered the 'envoy of mankind' and are entitled to assistance from State parties in distress and emergencies. However, the treaty makes no differentiation between

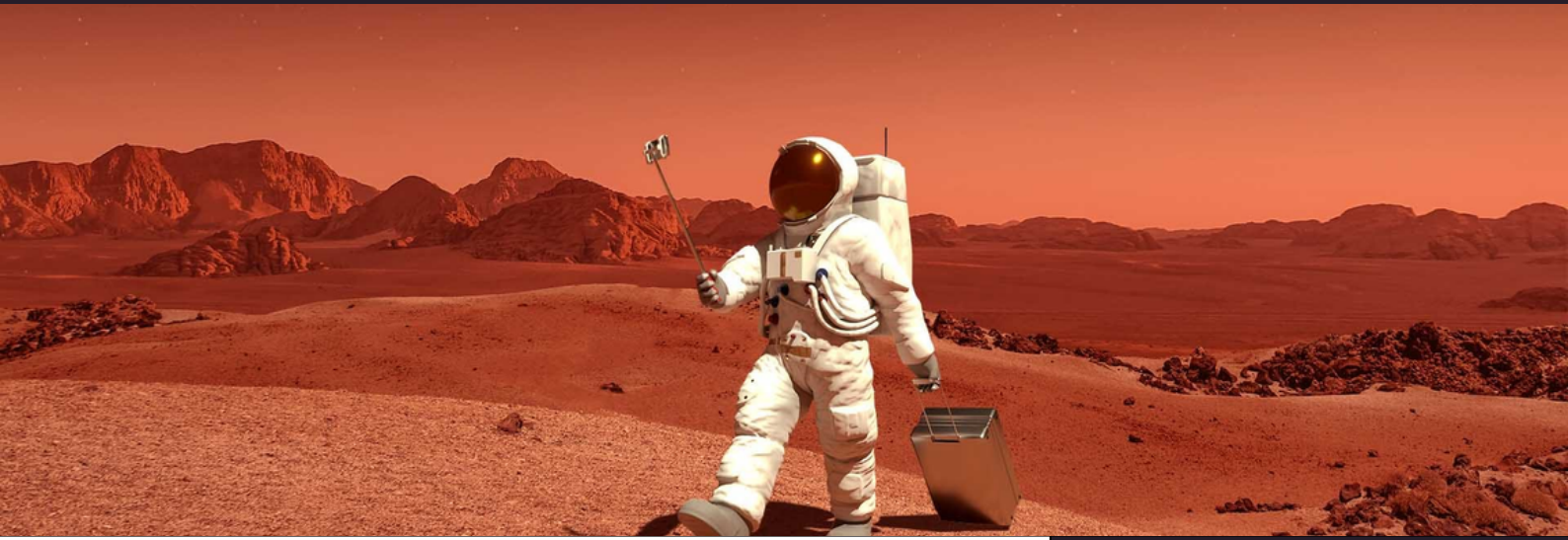
astronauts and civilians. The Rescue Agreement of 1968, ratified by 98 States, provides for assisting astronauts in distress and recovering objects that landed on their territory. The 1976 Registration Convention requires countries to register their space objects to the UN to ensure transparency and safety in space operations, including tracking space debris and preventing potential collisions. The Liability Convention of 1972 imposes responsibility on States for any harm caused by their space objects, aiming to ensure compensation and encourage responsible behaviour in space exploration. However, in space tourism, private companies often operate the spacecraft. In case of an accident, the question of who will be liable - the launching State or the private company - is difficult to adjudge.

Current space laws seriously lack a distinction between astronauts and space tourists. Questions arise as to giving protection under the OST and Rescue Agreement to astronauts and whether others should receive a lesser status. Neither agreement defines "astronaut." Passengers are neither conducting research nor are they

Upcoming Activities

ASIL Global Health Law Interest Group Student Writing Competition

This competition aims to foster insightful and impactful discussions among students globally on crucial health law topics that have international significance. Starting in 2024, the GHLIG will award annually a Prize to the author(s) of an unpublished paper that a Selection Committee considers to be outstanding in the field of global health law. The competition is open to any individual enrolled in an undergraduate or graduate program in any country. For more information see [here](#).



sent as representatives of any nation. They invest millions for the thrill of travelling into space. Apart from NASA's attempt to use the term 'spaceflight participant,' the USA created its own distinction between 'government astronaut' and 'spaceflight participant' in the Commercial Space Launch Competitiveness Act.

The international community could adopt this distinction outlined by the USA to resolve the ambiguity in the usage of 'astronaut' in the (OST. There should be collective efforts to incorporate classifications that reflect the roles and responsibilities of all space travellers. Also, there is enormous risk involved with space travel that spaceflight participants are not trained for. When the general public is involved, minimum safety standards should be implemented, which should be included in international laws.

In conclusion, the evolution of space tourism into a complete industry presents unique challenges against existing space laws, which need updating. The international community must address issues of classification of space travellers, their roles and responsibilities, and minimum safety standards.

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Upcoming Activities

Workshop on the Contribution of the United Nations War Crimes Commission to International Criminal Law:

Last year marked 80 years since the establishment of the United Nations War Crimes Commission (UNWCC) in London. To mark this occasion, the Research Centre in International Justice in Maynooth University is seeking abstracts to participate in a workshop on the contribution of the United Nations War Crimes Commission (UNWCC) to International Criminal Law. This event will take place on 12 July 2024 online and in person. The deadline for submission of abstracts is 3 May. For more information see [here](#).