

ENVIRONMENTAL GOVERNANCE OF SPACE UNDER LAW

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THE CHALLENGE OF SPACE GOVERNANCE

- **Space is only environment that is not legally considered an “environment”**
- **Space is essential to humanity’s sustainable development but is not governed by principles of sustainable development**
- **Space is reputed to be legally “closed”, but nothing could be more open**
- **Problems facing human activity in space are problems of law**

KEY PROPOSITIONS

- ❖ Space is the *common heritage of mankind*. Boundaries to States' freedom of activity with regard to the future of space must be defined at the international level; space must not be exclusively a topic of inter-State negotiation for benefit of consensus parties.
- ❖ The central objective of environmental governance of space under law should be to prevent/remediate the pollution of the capabilities and functioning of space-based human support systems upon which depend all of humanity including especially our collective progeny.

THE CASE FOR ENVIRONMENTAL GOVERNANCE OF SPACE

Indictment: The ongoing pollution of orbital space is an *environmental nuisance* in violation of international law.

Verdict: All spacefaring States bear common but differentiated responsibilities to optimize safe and peaceful disposal of inoperative satellites and other debris. These responsibilities operate both prospectively and remedially.

International law's objective: Design and implement a system for environmental governance of space built on imperatives of sustainable development

Recommendation: United Nations High Level Political Forum for Sustainable Development should prioritize space and begin transition toward its environmental governance

LEGAL PROPERTIES OF *ENVIRONMENTAL NUISANCE*

- Nuisance has a low threshold of fault. Can begin with seemingly innocuous behavior in ignorance of long-term consequences.
- Harm is to users as a whole (humanity), not to any individual. Accountability for harm to a specific victim is difficult especially as nuisance often induces avoidance.
- Nuisance worsens unless harmful conduct is enjoined; costs of abatement/remediation inevitably increase with time.
- Future harm is unknowable. By the time that immensity of environmental nuisance is fully manifest, too late for backward-facing attribution of responsibility and post-damage accountability.
- Law requires corrective action through specific performance whereby responsible parties must improve the condition even if no catastrophe has yet been suffered.
- Obligations are imposed to prevent, mitigate and remediate the nuisance, thereby restoring the community's (humanity's) imperative of abatement.

THE SPACE DEBRIS CONDITION

- **21,000 pieces of debris > 10cm; 100 million smaller particles; all moving at destructive speed**
- **Space debris is self-generating: the cascade effect. Orbital collisions produce more debris which, in time, produces more collisions, etc.**
- **Lower Earth Orbit (LEO) may be already unstable: some experts refer to its “runaway” status.**
- **Early 2007, China fired a ballistic missile at its no-longer-operable Fengyn-1C weather satellite about 860 km up in low earth orbit, blowing it into a cloud of debris.**
- **Predicted rate of catastrophic collisions over the next 200 years**
 - **Inter-Agency Space Debris Coordination Committee (“IADC”): between 1 in five and 1 in nine years.**
 - **NASA: 71 catastrophic collisions and 76 non-catastrophic collisions**
 - **A Lawrence Livermore Laboratory study: by 2100, as many as 50 near collisions per day.**

SPACE DEBRIS VIOLATES TWO COMPLEMENTARY PRINCIPLES OF INTERNATIONAL LAW

1. **Right of peaceful passage to and through *res communis* –**
 - A. Legally, orbits are straits – natural passageways used to facilitate communication and navigation.
 - B. ICJ affirmed right to navigate through international straits under “elementary principles of humanity” *Corfu Channel Case* (1949)
2. **Responsibility for transboundary harm**
 - A. Principle 2 of Rio Declaration: States must ensure that activities in their jurisdiction or control do not damage environment of other States or of areas beyond national jurisdiction.
 - B. Responsibility means duty to prevent harm (not duty to compensate). Obligation is to assess impacts

Ultimately, debris creates a hostile space environment for satellites and all other uses due to the high risk of damage-causing collisions. Although the current incidence of collisions is low, this is only expected to remain true for a short time.

REMEDYING THE LEGAL WRONG

1. **Absolute prohibition of intentional destruction of objects in space absent international authorization – if you won't/can't clean it up, don't break it!**
2. **Facing forward: All launched objects must only contribute minimally to space debris; States must ensure satisfaction of standards for limiting debris and eventual removal of launched objects from space. [Compliance Paradox]**
 - A. **Keystone: Impact Assessment must be a precondition to space activity**
 - B. **International standards raise difficult issues of fairness in terms of who should bear costs?**
3. **Remediation of existing debris: Law's objective is not to punish but to enable abatement on behalf of the human community**
 - A. **All spacefaring States share common but differentiated responsibilities**
 1. **Each State's responsibility is a function of the magnitude of debris-creating activity and degree of care exercised**
 2. **Strongly weighted increment of responsibility is added for intentional or wanton debris-creating activity**
 - B. **Responsibility is to pay, proportionally, costs of globalizing remediation of the space environment**
 1. **All spacefaring States share responsibility for developing international space remediation capacities**
 2. **Capitalize a "Fund" or "Enterprise" – From each according to its culpability; to all according to our needs.**

POLICY CONTEXT FOR IMPLEMENTING THE LEGAL REMEDY

- 1. Prime Imperative: Preserve and expand opportunities for using space for future generations**
- 2. Use of space to promote global development is good; entrepreneurship and innovation deserve reward and should be engaged in policy design**
- 3. Mission: Humanity-wide capitalization of space innovation**
 - A. Looking forward: Encourage widespread capitalization/adoption of best technologies for eventual disposal of dead satellites and other space objects**
 - B. Looking backward: Space debris remediation should be linked to near-term remunerative space opportunities**
 - 1. Encourage entrepreneurial investment in cleanup technologies**
 - 2. Costs of remediation should be spread to widest sets of interests and incentivized**

FRAMING ENVIRONMENTAL GOVERNANCE OF SPACE: IMPERATIVES OF SUSTAINABLE DEVELOPMENT

[THE FUTURE WE WANT]

- 1. Imperative of action (inertia escalates dangers): Need for proactive governance**
- 2. Imperative of systematic decision-making through coherent international processes: Need for an institutional capacity for environmental governance of space**
- 3. Imperative of evidence-based scientific assessment: Need for authoritative scientific commission to engage global scientific communities with the aim of sustainable development of space**
- 4. Imperative of inclusive participation: Need for gov'ts, civil society, entrepreneurs to engage in processes that foster transparency, are fully informed, and are reviewable**
- 5. Imperative of global capacity building: Need for mechanisms of cooperation and capacity building on behalf of all humanity especially developing countries**

ADVANCING ENVIRONMENTAL GOVERNANCE OF SPACE UNDER LAW

United Nations High Level Political Forum for Sustainable Development should designate *environmental governance of space* as an important priority

1. Define a research agenda for expert analyses and perspectives from multiple disciplines
2. Specify topics needing intense attention at heart of space governance, *e.g.*
 - A. Define standards for environmental assessment of prospective space activities, both substantive metrics and regulatory processes
 - B. Consider mechanisms of technology transfer and entrepreneurial reward that are best designed for achieving sustainable development of space, including risk evaluation, capitalization, insurance, and certification

JUDGEMENT

It is difficult to conceive of humanity's sustained development if generations hence are obstructed from full enjoyment of space by our generation's refusal to accept responsibility for pollution of orbital space.

Accordingly, the most important question with regard to *environmental governance of space* is not whether, but when. This much is certain: governance will cost more the later it begins.

If environmental governance of space is mandatory in humanity's future, why not start now?