



## Space Security and Legal Aspects of Active Debris Removal

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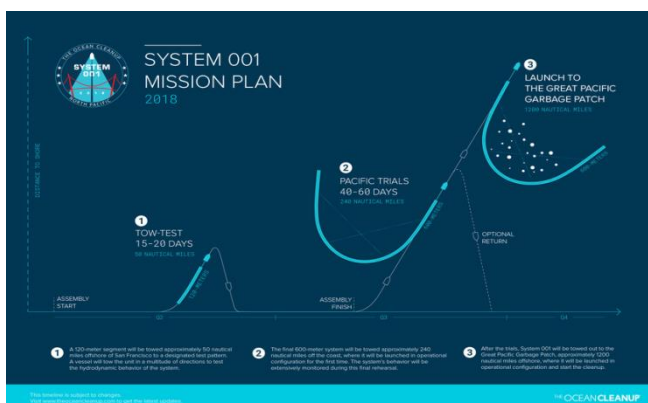
The introduction to the book states:

“Many aspects of our daily lives have already come to depend on our occupation of Low Earth Orbits (LEO) and Geostationary Earth Orbits (GEO). As the number of space related activities increases exponentially, most notably for commercial purposes, so does the number of orbiting space debris that threaten to cause potentially irreparable damages. The "big sky" theory, which protected airborne travelers for almost two decades before becoming obsolete will soon suffer the same fate in regard to space travel. The future of space activities partially depends on the answers from the international community to this problem. As the number of space activities and debris grows exponentially, not only it is necessary to guarantee the sustainable development of outer space and earth orbits, a limited natural resource, but it could also constitute an obligation under both international space law and international law for space faring Nations to cooperate in order to accomplish this. Furthermore inter-



national involvement in the regulation making process for space traffic management and space debris removal has been sparse, if not non-existent, save for a few non-binding documents. The adoption of an international treaty on space debris removal and the creation of a dedicated international organization is therefore an option that merits rapid consideration.”

My interest got aroused by the title of the book, hoping to find some ideas for debris removal on Earth, in particular in the Oceans, as this subject is becoming more and more of an immediate and pressing global problem: plastic debris and nano-particles are threatening human and animal life on Earth.



“Over 5 trillion pieces of plastic currently litter the oceans. Trash accumulates in 5 ocean garbage patches, the largest one being the Great Pacific Garbage Patch, located between Hawaii and California. If left to circulate, the plastic will impact our ecosystems, health and economies. Solving it requires a combination of closing the source, and cleaning up what has already accumulated in the ocean.”[1]

However the situation for active ocean debris removal actions is the same as stated for space debris in the introduction above: “**debris removal has been sparse, if not non-existent,**

The book contains 11 thoroughly researched international experts papers with much legal “fine-print” coming to the following conclusions (the indicated numbers refer to the chapters of in the book):

The increase of both space traffic and the number of space debris therefore has to be dealt with in an efficient manner, preferably with the participation of all space faring Nations as the existence of an international obligation to cooperate has previously been proven. (1)

On the basis of the obligations to settle disputes peacefully, States have the freedom to solve their controversies through diplomatic channels or through adjudicative methods, including the brand new PCA (Permanent Court of Arbitration) Outer Space Rules. Even if adjudicative methods of dispute settlement are preferable as they result in binding decisions rather than proposals or recommendations, as is the case for diplomatic means, in the event of dispute concerning ADR, States may favor opting for political solutions that are able to preserve the confidentiality of space asset information. (2)

It is inevitable for modern space law to develop a hierarchy of needs or a system of priorities which includes from highest to lowest (a) the prevention of life threatening dangers (b) the maintenance of international peace and security in outer space (c) the advancement of a state's interests. (a) to (b) his normally justifiable category (c) requires more security. At the end of the day, one should balance the potential benefits the deriving from the space debris removal missions against the cost of actions born by the registering state in the orbiting it's object. To cope with the distinction between identifiable and unidentifiable object a state Registration Convention has to be created (3)

Papers (4) and (5) deal with the legal aspects of active space debris removal of weapons in space and the right of self-defense in space.

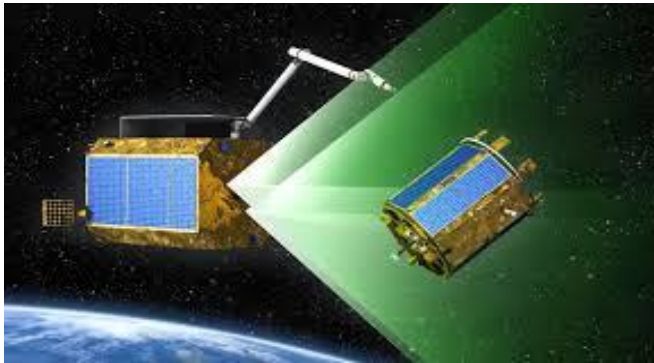
Prospective legal framework and technological interventions raises the question of “macro” and “micro” law delineations and the importance of legal certainty – however this enquiry raises more questions than answers, the questions deserve a quick response, otherwise industry will cut its own path which in the long run will lead to inequitable outcomes and new dangers to the global commons. (7)

“Creative imaginations” and foundations of an international system for space traffic management are discussed (8), the US law and policy on space debris is presented in detail (9) as well as the Finnish Space Activities Act (10) and the French law approach around Active Space Debris (ADR) removal (11).

As mentioned above, the problematic of space debris and “ocean debris” have much in common: some legal tools are available but a global consensus is missing. The upcoming problems are identified and it is agreed that something has to be done very soon on a global level by international bodies and organizations acting as coordinators and driving forces – however the implementation is lagging and the danger is to get caught up in legal and financial questions.

The books is an excellent educational summary and raises attention for all of the legal aspects associated with space debris removal (responsibility, liability, economic impacts, national interests, global hazards, etc.), identifies and helps to understand the problems to come to grips with a unified agreed and coordinated solution of active space debris (ADR) removal. The book is in particular addressing legal experts familiar with the regulations already available within COPUOS (Committee on the Peaceful Uses of Outer Space) and requires a general legal background.

The current technical status of various debris removal initiatives is outside the scope of this book, but would have been a good expansion e.g., the Deutsche orbital servicing demonstration mission (DEOS) [3]



Two satellites (Servicer and Client) were to be launched together and brought into orbit at a height of 550 kilometers. According to planning, DEOS was to be ready for launch in 2018. But, as if to prove the difficulties of such an active debris removal project DEOS was cancelled after the definition phase. [4] Discussions are under way to revive the project as an European undertaking (e.Deorbit) within the European Space Agency (ESA).

“Boyan Slat, CEO, Ocean cleanup System tweeted on December 31, 2018: “I had hoped for a better end for this year, but I am confident that we will get the Ocean Cleanup 2019 fully functional”. [2]

*May the “Space Security and Legal Aspects of Active Space Debris Removal” book contribute its share to initiate similar messages in the near future! It definitely sharpens the reader’s awareness for the urgency and difficulty of the matter.*

#### References

[1] <https://www.theoceancleanup.com/>

[2] <https://utopia.de/gegen-plastikmuell-im-meer-the-ocean-clean-up-startet-frueher-als-geplant-52156/>

[3] DEOS: Deutsche orbital(e) servicing mission

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[3a] Staus DEOS: <https://fragdenstaat.de/anfrage/deos-deutsche-orbitale-servicing/>

[4] [https://space.skyrocket.de/doc\\_sdat/deos.htm](https://space.skyrocket.de/doc_sdat/deos.htm)

January 2019, Joachim J. Kehr, Editor SpaceOps News for “Journal of Space Operations & Communicator”

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