

# **Legal Aspects of NEO Threat Response and Related Institutional Issues**

**Final Report – Executive Summary**

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**The Research Project is undertaken by the University of Nebraska-Lincoln's Programme on Space and Telecommunications Law, sponsored by the Secure World Foundation and with the support of an International Advisory Board of eminent international space law experts from various states around the world, members of the International Institute of Space Law (IISL) and the International Academy of Astronautics (IAA).**

**Rapporteur:**

- Prof. Frans von der Dunk, University of Nebraska-Lincoln

**International Advisory Board:**

- Prof. Steven Freeland, University of Western Sydney, Australia;
- Prof. Joanne Gabrynowicz, Director, National Center for Remote Sensing, Air & Space Law, University of Mississippi, United States;
- Prof. Stephan Hobe, Director of the Institute of Air and Space Law, University of Cologne, Germany;
- Prof. Mahulena Hofmann, University Giessen;
- Prof. Ram Jakhu, Institute of Air and Space Law, McGill University, Montreal, Canada;
- Prof. Sergio Marchisio, University of Rome "La Sapienza", Italy;
- Prof. Matthew Schaefer, University of Nebraska-Lincoln, United States; and
- Prof. Maureen Williams, University of Buenos Aires / Conicet, Argentina

**Research assistant:**

- Artiom Anisimov, LLM Candidate, Space and Telecommunications Law LLM Programme, University of Nebraska-Lincoln

*Address all inquiries to: Professor Dr. Frans G. von der Dunk, University of Nebraska-Lincoln, College of Law, 214 McCollum Hall, P.O. Box 830902, Lincoln, NE 68583-0902, fgvonderdunk2@unl.edu.*

## Executive Summary

With regard to potential threats to mankind and the earth posed by Near-Earth Objects (NEOs), three main conclusions can be drawn: (1) developments in space science and space technology have made it possible to predict with some accuracy (and sometimes decades in advance) whether a NEO may present a serious threat, (2) developments have also made it possible in many cases to undertake successful efforts to minimise the chance of actual collision with the earth, but (3) a, preferably international, framework for dealing with such issues is conspicuously missing, which may lead to unnecessary risks of NEO threats resulting in potentially catastrophic damage.

Regarding the third conclusion, the need for more comprehensive and in-depth analysis of the key legal and institutional issues involved in future international NEO threat mitigation, preferably prior to the first occasion of an actual serious NEO threat arising, has become clear. To address this need the University of Nebraska-Lincoln College of Law has, with the sponsorship of the Secure World Foundation and the support of an International Advisory Board of eminent international space law experts from various states around the world, members of the International Institute of Space Law (IISL) and the International Academy of Astronautics (IAA), taken the initiative for a Research Project on Legal Aspects of NEO Threat Response and Related Institutional Issues.

The Research Project has as its overriding goal ***to aid the international community of states and the relevant decision-makers in arriving at a proper, fair, transparent, comprehensive, workable, politically, institutionally and legally sound and feasible framework for international decision-making in the face of future NEO threats***, notably by analysing some of the key legal and institutional issues involved and by offering, where appropriate, recommendations on how to further develop the legal and institutional framework for NEO threat response.

Research, analysis and conclusions focused on the five following interlocking major clusters of legal/institutional issues: (1) general state responsibilities and obligations; (2) specific liabilities for damage; (3) the use of physical force, possibly even nuclear devices, in outer space; (4) the institutional structure; and (5) the proper role of commercial activities, in particular as undertaken by private enterprise.

In respect of each of the five clusters the Report analyses the current status of international law, taking into consideration as relevant general principles of national law; outlines where further research, analysis and/or discussion may be required; comes up with conclusions as to where gaps, overlaps, inconsistencies or lack of clarity exist; and offers some recommendations on how such flaws in the current legal framework could be addressed.

With regard to most of the aspects of legal issues analysed above, problems arise in terms of application of existing international law to solve the potentially dangerous and divisive, in worst cases catastrophic, threats NEOs could come to pose. In some cases, there exists no international law of much substance and at best some general principles that could be distilled from national law, such as on tort liability and the 'Good

Samaritan' principle – and even these principles are not completely uniform across the various national jurisdictions. In other cases, such international law has just started to develop and is still subject to considerable debate as to its precise ramifications; this is the case for instance with the 'responsibility to protect' and the ramifications of the International Charter on Space and Major Disasters in this specific context. In still other cases, moreover, there may perhaps not be such an absence of relevant international norms in general terms, but application thereof to the NEO threat response issue in particular may result in considerable, likely counter-productive complications, such as with the Liability Convention and (arguably) the use of nuclear force.

A first crucial step towards solving such issues in the most generic fashion would be to establish a proper international framework for decision-making. Such a framework would, firstly, where necessary, carve out from existing, more international and more general responsibilities and liabilities the specific context of NEO threat response actions and provide for adequate specific versions thereof. Secondly, alongside existing principles and customary law applicable to the subject it would result in – or at least provide a starting point for developing – customary international (and at a later stage perhaps treaty) law where no relevant international legal rules or principles exist, using as appropriate concepts and principles of national law. And thirdly, perhaps most important of all, it would underpin the development of a level of transparency and trust that would help to prevent divisive political tensions where the legal rules would not (yet) be clear.

***Key to the success of such a framework would be a proper and workable balance between the interests and sovereign competencies of the (relatively few) states capable of actually undertaking successful NEO response missions and the rights and interests of all other states and humanity as a whole in being protected against threats posed by NEOs.***

Under the current circumstances, a construction *mutatis mutandis* analogous to the roles of the UN Security Council, the UN General Assembly and individual sovereign states in the context of the UN role in preserving international peace and security, whether actually involving these UN bodies or not, provides the shortest and most effective route to such a balanced framework.

Under such a framework:

- any acknowledged responsibility to protect would be given a realistic chance of being complied with against a NEO threat by means of a balanced mandate on behalf of all states and mankind to be implemented according to certain guidelines and standards;
- liabilities for damage caused in spite of a mission taking place within the terms of the mandate concerned may be properly arranged, waived or otherwise dealt with as the case may be;
- the use of force, including even nuclear force as a measure of last resort, will not be prohibited if genuinely required in the defence of mankind – whilst allowing as little room for abuse as possible; and

- where necessary commercial interests, including those of private enterprise, can be harnessed for the cause by the states undertaking missions related to NEO threat responses, as long as remaining within the mandate.

The Report consequently offers the following seven key Recommendations to the international community.

**#1. It is important to soon start discussions within the UN framework as to whether and how to develop an international decision-making framework along the lines sketched above within the present structure of the UN, notably as regards the roles of the UN Security Council and the UN General Assembly.**

**#2. A form of the ‘responsibility to protect’ should also be recognised in the NEO context as specifically requiring from states that have the capacity to generate relevant information and/or to respond to NEO threats to undertake such actions, after proper international coordination – preferably within a decision-making framework as recommended above in #1 – and without interfering with their sovereign powers to determine the details of any such mission.**

**#3. It should be recognised that if damage occurs in spite of a NEO response mission, or as a consequence of such mission being not (completely) successful, the state(s) responsible for such mission should not be held liable for such damage as long as the mission was undertaken within the parameters set by a proper mandate by the international community – preferably through a decision-making framework as recommended above in #1 – as well as by specific agreements with the state(s) responsible for such mission, as appropriate and applicable.**

**#4. In the international discussions on the use of force in outer space care should be taken that the result of such discussions will not unduly obstruct the use of force that might be required under some scenarios of NEO threats.**

**#5. As to the use of nuclear force in particular, this should be expressly recognised to be acceptable only as a last resort option, whilst ways should be explored to carve out very limited exceptions for NEO response purposes from the existing legal regime, which clearly prohibits any nuclear explosions in outer space, and which are consistent to the degree possible with the UN Principles on Nuclear Power Sources.**

**#6. A proper legal regime for handling possible commercial interests, including those of private enterprise, in exploitation of natural resources in outer space without threatening the clear-cut interests of all states and mankind at large in the proper conduct of such activities should be developed to ensure that any involvement in NEO response activities for commercial gain is only to be allowed if the overarching goal of such missions is not threatened or compromised thereby.**

**#7. A working group should be instituted by COPUOS, notably by the Legal Subcommittee in close consultation with the Scientific-Technical Subcommittee, to further investigate, discuss and develop the recommendations ##1-6 offered by the present Report, as well as the various options available in this regard.**