

A02

## The Removal of Space Debris and International Law-Making Process

**Yurika Ishii (National Defense Academy of Japan)**

This presentation considers possible options of international law making considering the regulation of the space debris removal activities. Space debris may bring about various problems such as the contamination of the orbit and harmful interference against other states' activities.

From the legal point of view, relevant issues include (1) the jurisdiction of the removing state (e.g., on what conditions the removing state is entitled to destroy the debris); (2) the responsibility of the launching state (e.g., to what extent the launching state should bear the cost of the removal of the debris; what sort of standards should the launching state adopt when it launches the satellite); (3) the property rights of the owner. Yet, there is neither legally binding treaty which directly deals with these issues nor customary international law, and it is expected that soft-law instruments will play an important part.

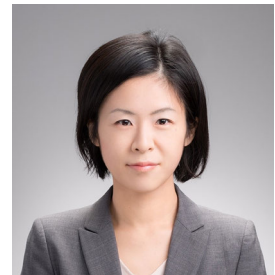
This presentation will explain what sort of types of law-making instruments are available, taking into account the law-making in the field of space law as well as other areas such as law of the sea and environmental law.

### **Biography**

#### **Yurika Ishii**

Associate Professor at National Defense Academy of Japan

Yurika Ishii's areas of interest include general public international law, space law, law of the sea and international transnational criminal law. She achieved Ph.D from the University of Tokyo, Graduate Schools for Laws and Politics with a thesis on international regulation of economic crimes, which was published as *International Regulation of Transnational Crimes* (Yuhikaku, 2017)(Japanese). She stayed at Max Planck Institute for Comparative Public Law and International Law (Heidelberg, Germany, 2008, 2010), Max Planck Institute for Foreign and International Criminal Law (Freiburg, Germany, 2011) and Harvard Law School (Cambridge, the United States, with Fulbright Scholarship, 2014-15) as a guest researcher.



# THE REMOVAL OF SPACE DEBRIS AND INTERNATIONAL LAW- MAKING PROCESS

Yurika Ishii  
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Japan

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# STUDY GROUP OF LEGAL ISSUES ON THE ADVANCED ORBITAL ACTIVITIES

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## JAXA'S MID- / LONG-TERM OBJECTIVES(2018-2025)

To support government activities to establish the legal basis which is required to develop and implement policies concerning the advanced space activities, including space resource exploration and on-orbit satellite servicing.

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## THE GOAL OF THE STUDY GROUP OF LEGAL ISSUES ON THE ADVANCED ORBITAL ACTIVITIES



To examine legal issues related to JAXA's future activities.



Active Debris Removal (ADR)  
among On-Orbit Satellite Servicing.

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## WHAT WE DO



Identify the possible legal systems to implement the ADR



Examine pertinent legal issues concerning ADR mainly from international law perspective



Make proposals to the Japanese Government concerning the domestic law on ADR

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## The Study Group

**Joint Research Project**  
Space Law Research Center, Keio  
Legal and Compliance Division, JAXA

### Academia

Prof. Kazuhiro Nakatani  
Prof. Setsuko Aoki  
Prof. Tateo Horiguchi  
Prof. Yurika Ishii  
Prof. Makiko Shigeta

### Industry

NEC Corporation  
Kawasaki Heavy Industries, Ltd.  
Mitsubishi Electric Corporation  
Astroscale Japan Inc.

### Government (Observer)

National Space Policy Secretariat, CAO,  
Space Policy Division, MOFA  
Space Industry Office, METI  
Space Development and Utilization Division, MEXT

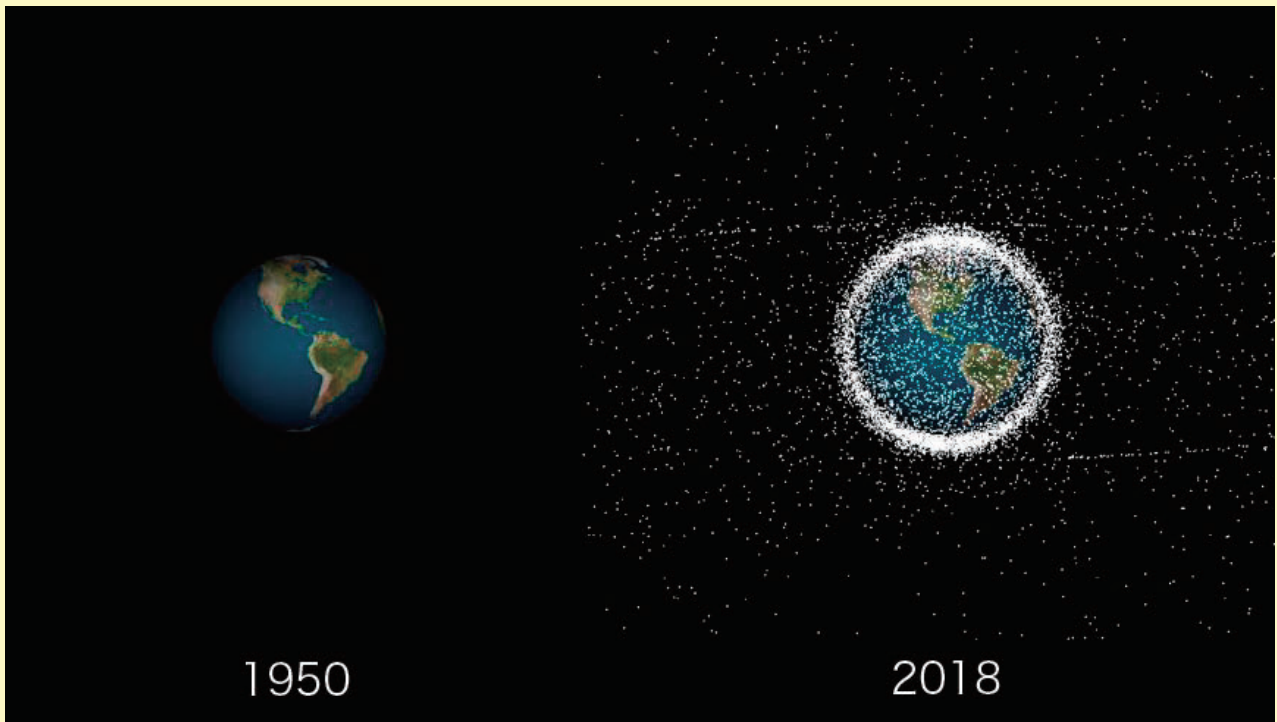
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Slide prepared by Akihiro Iwaki

# ACTIVE DEBRIS REMOVAL

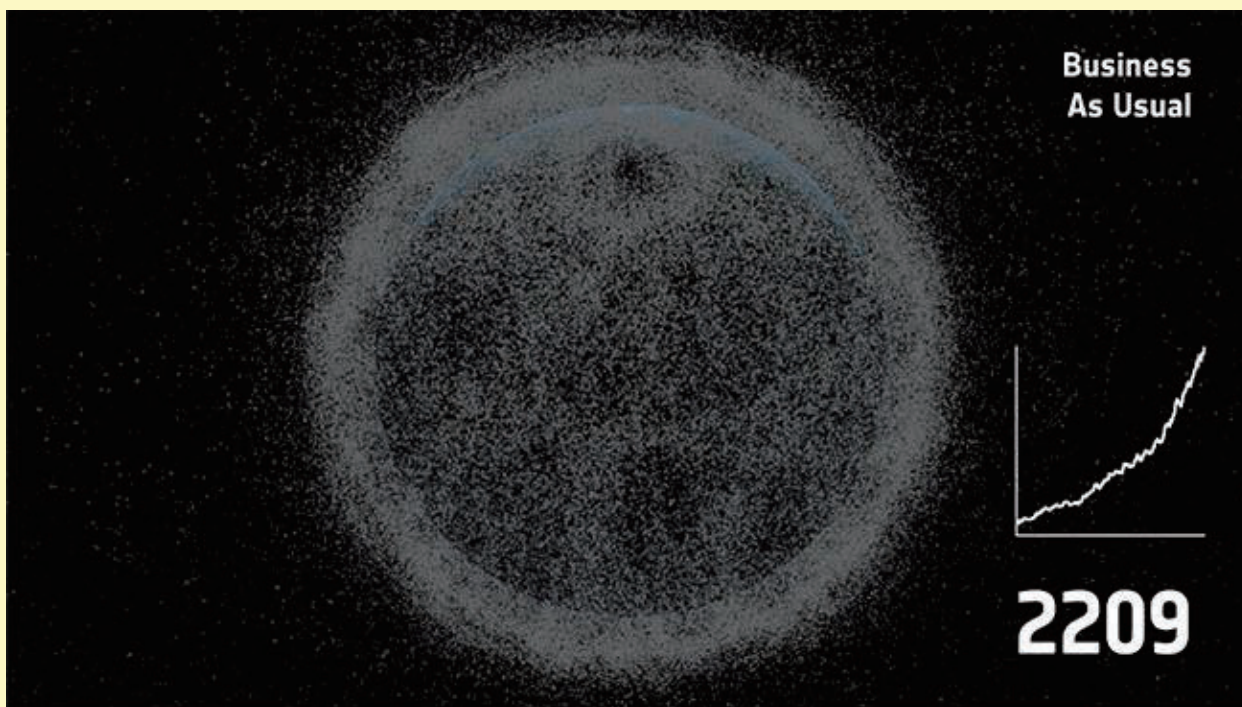
An Overview

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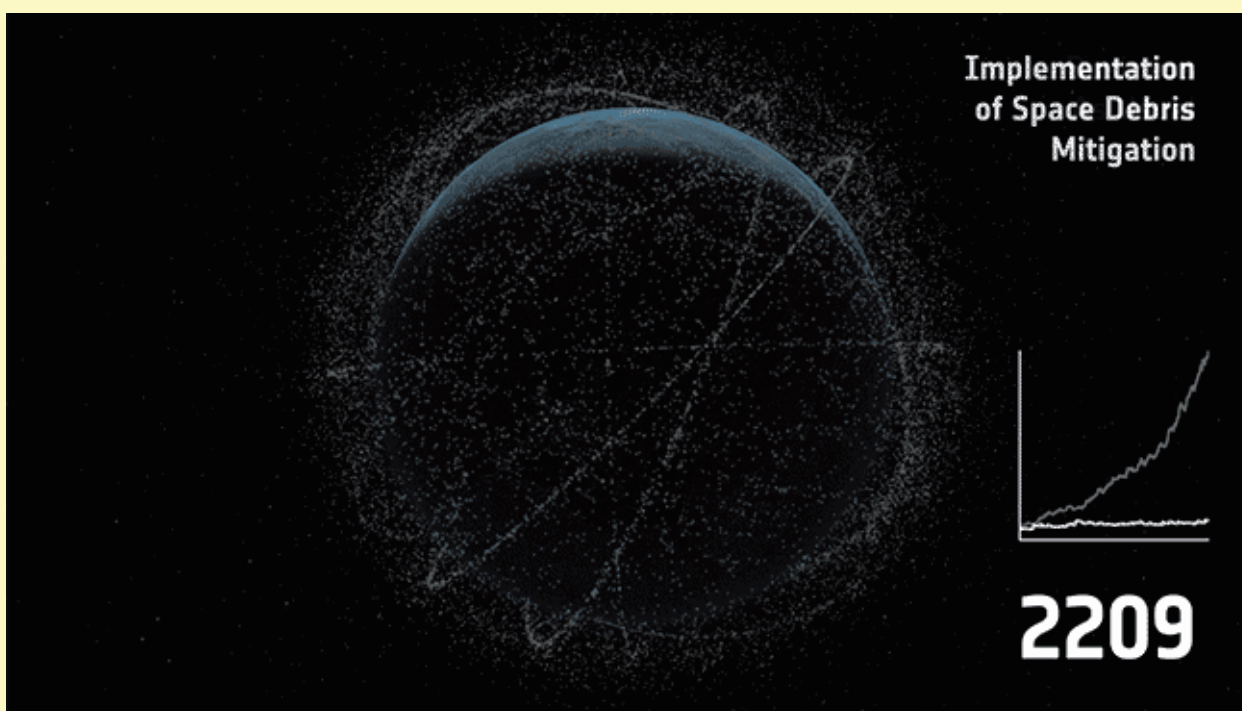
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## IADC SPACE DEBRIS MITIGATION GUIDELINES OF 2007



Limit Debris Released during Normal Operations



Minimize the Potential for On-Orbit Breakups



Post Mission Disposal



Prevention of On-Orbit Collisions

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## Identification and formulation of legal systems for supporting the ADR

- JAXA is planning to experiment an active removal of a large-size debris.

### The Experiment of Core Technology for ADR



Recognition of on-orbit situation

Proximity operation

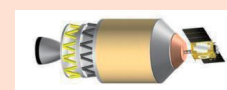
Advanced onboard image processing



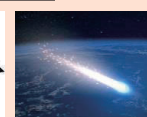
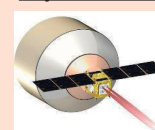
Toward the World's first Active Large sized Debris Removal



### ADR mission



Target (TBD) :  
The upper stage of a Japanese rocket

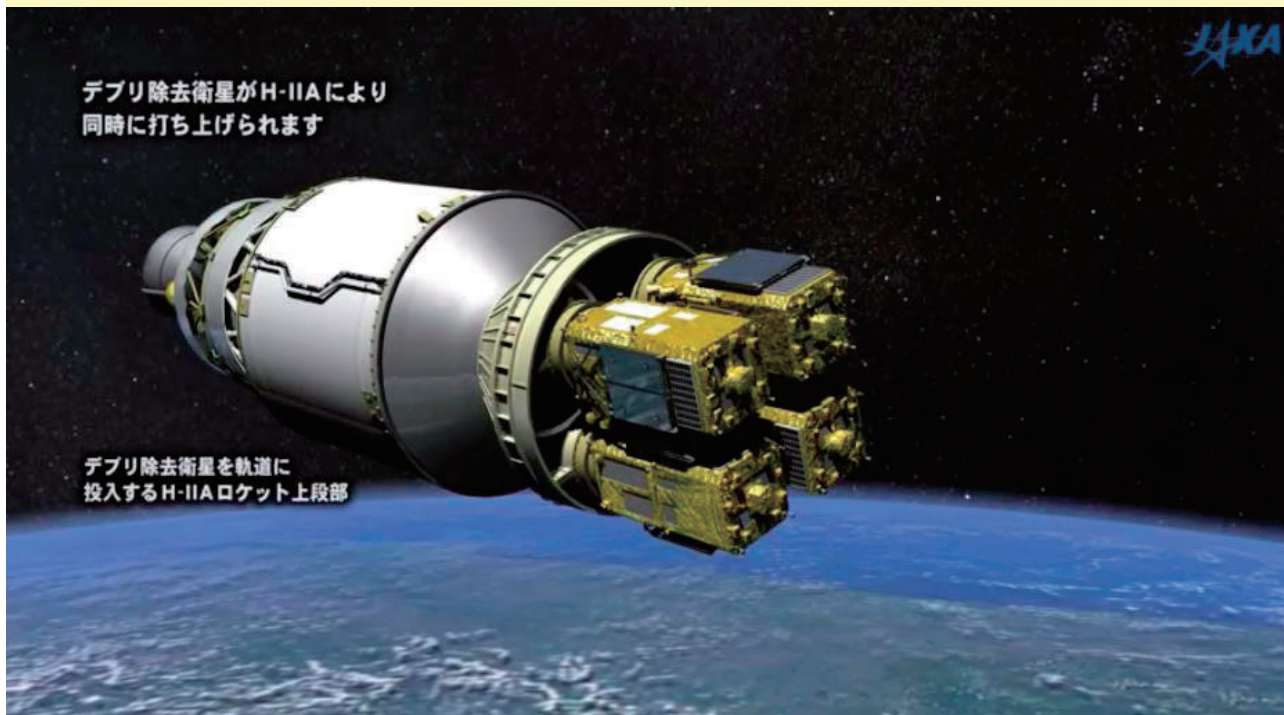


Approach/  
Capture/  
Orbit transfer/  
Controlled reentry

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Source: Presentation by Yasushi Watanabe at 1<sup>st</sup> meeting of the Study Group, modified and translated by Akihiro Iwaki





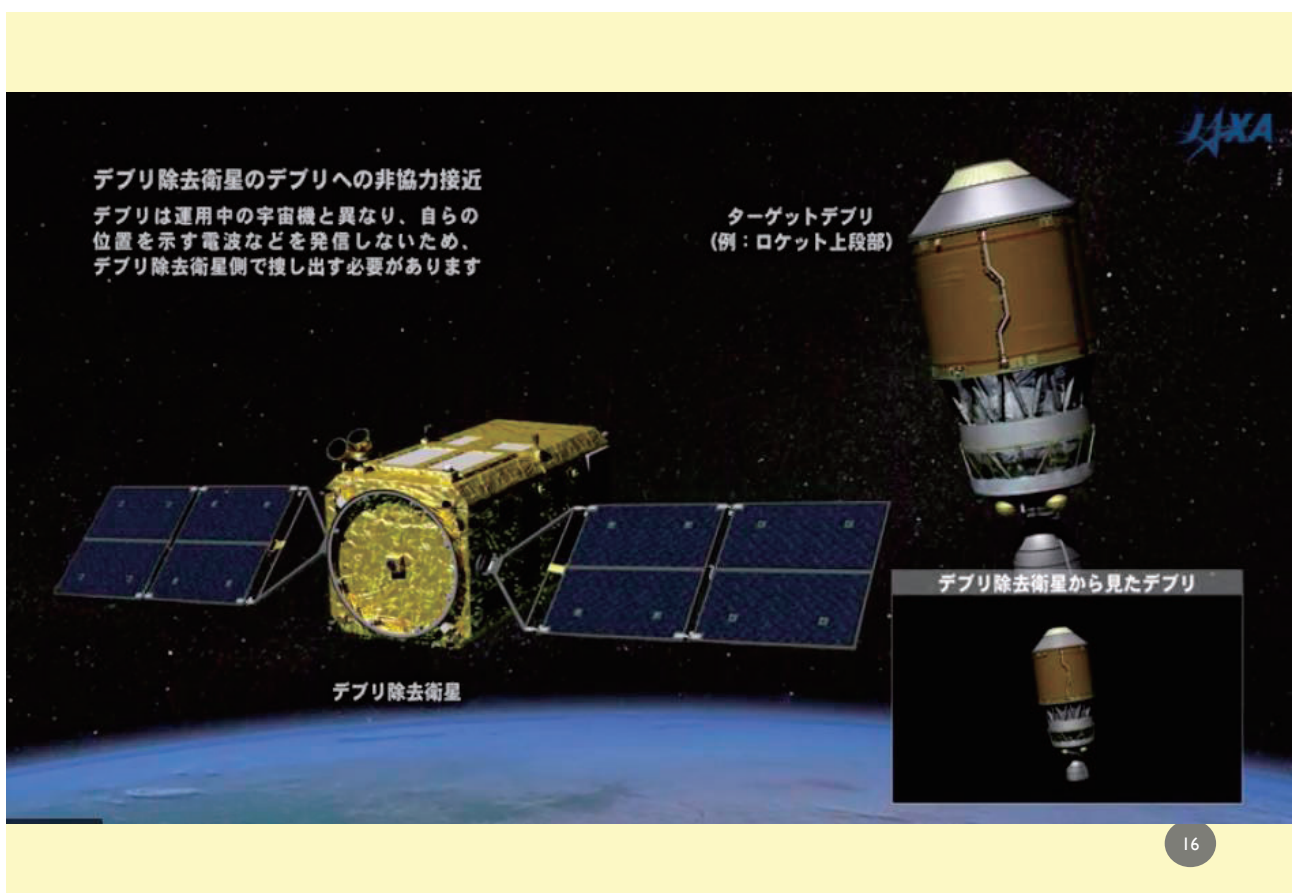
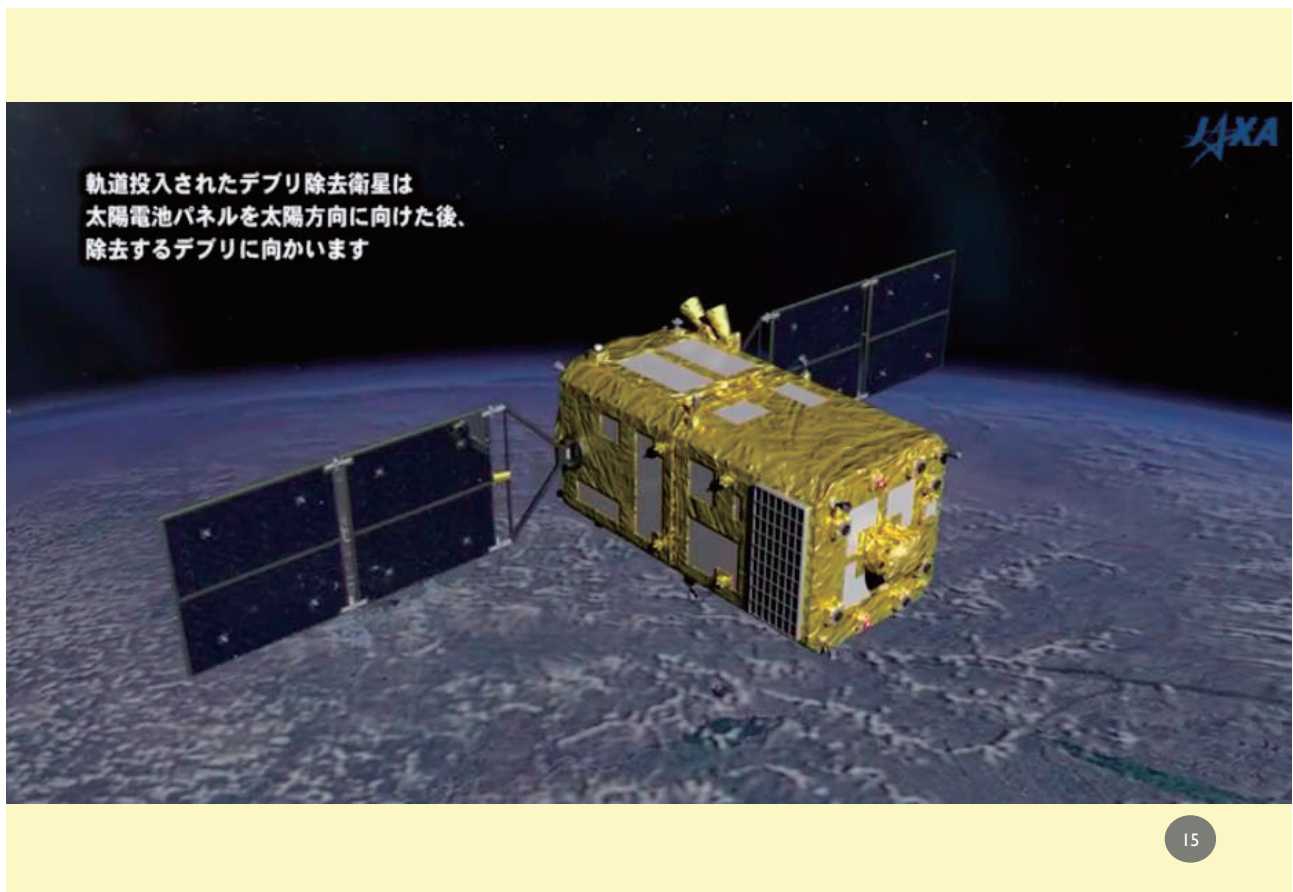
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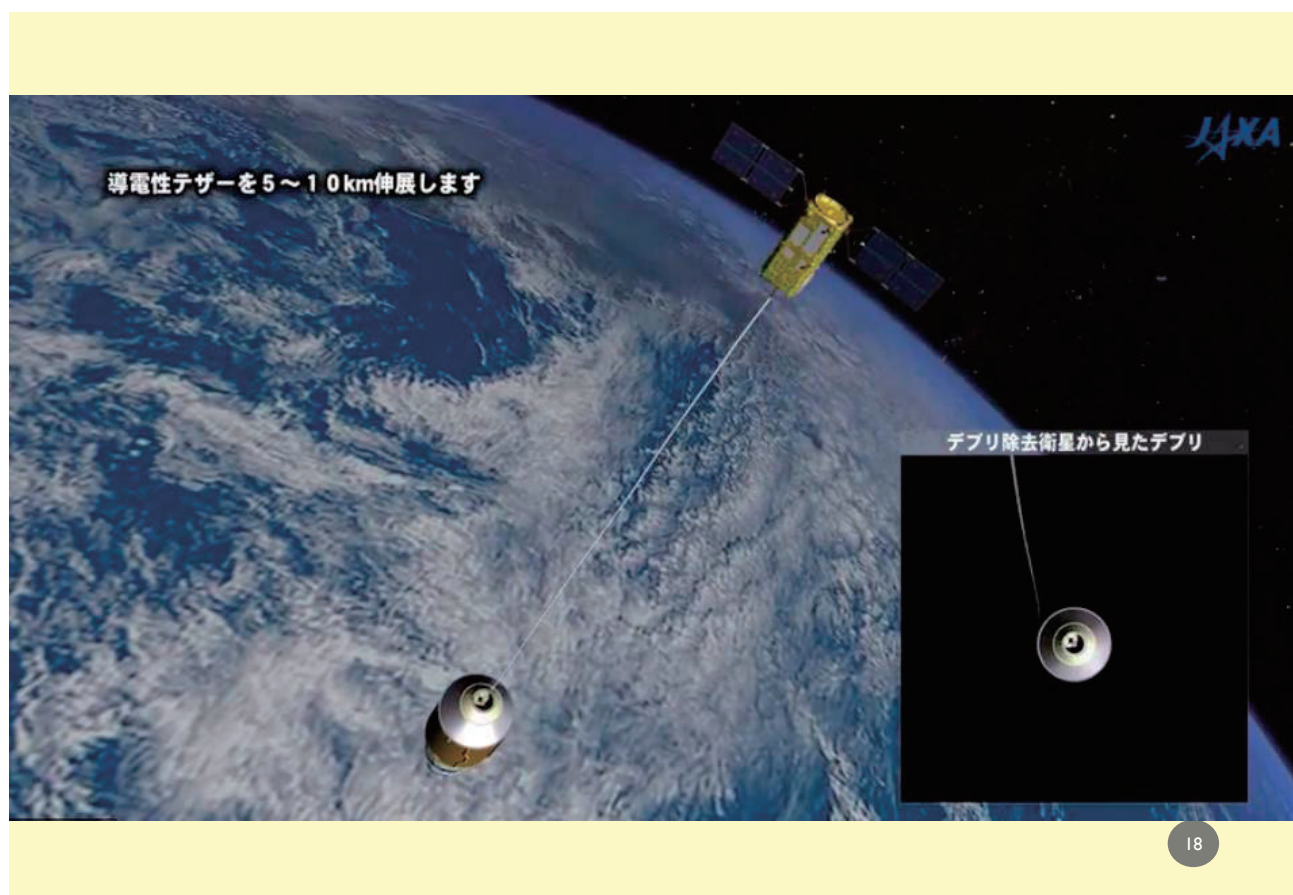
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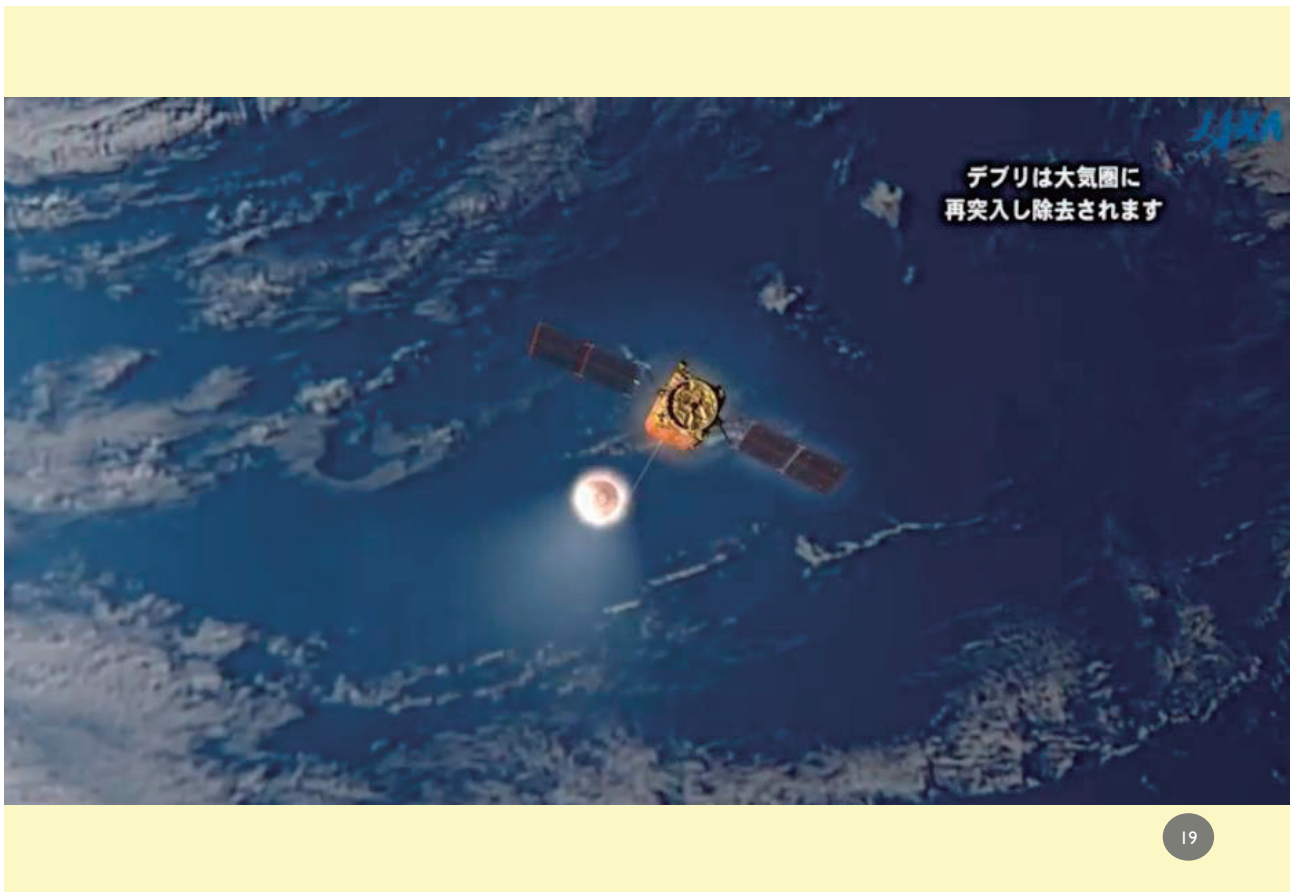
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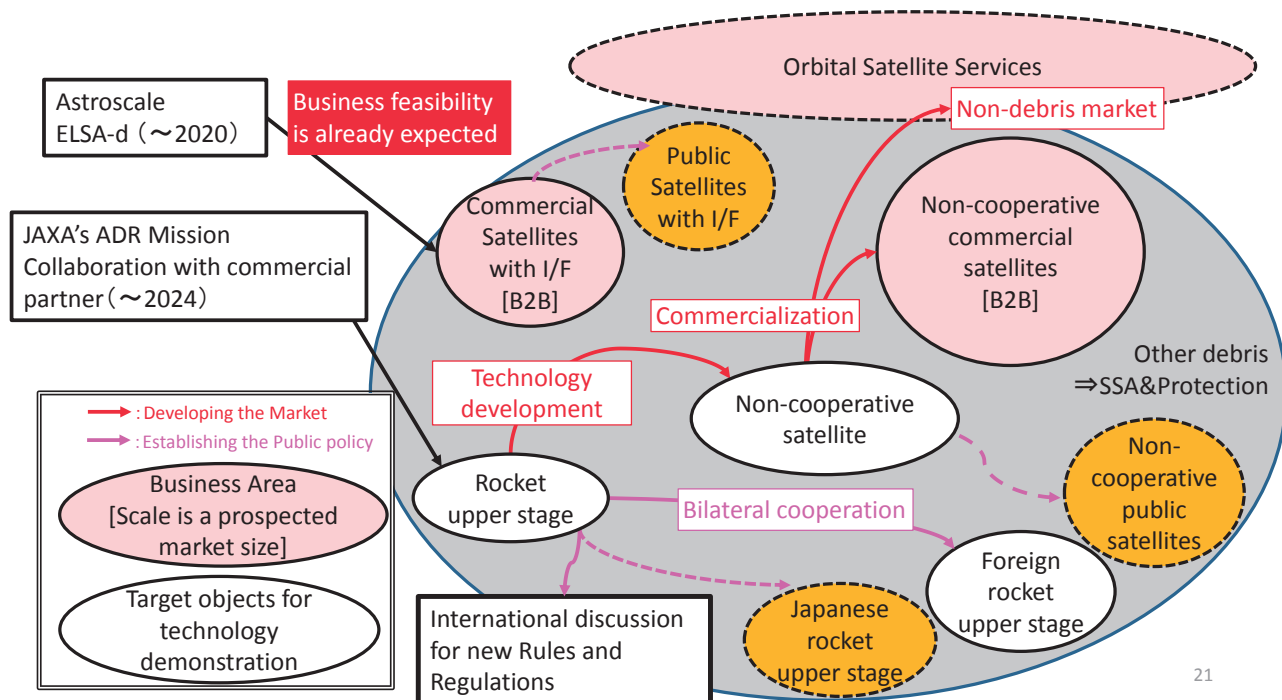








## Identification and formulation of legal systems for supporting the ADR



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## THE NEED FOR INTERNATIONAL STANDARD ON ADR ACTIVITIES



To promote industrial development by encouraging private parties to develop technologies



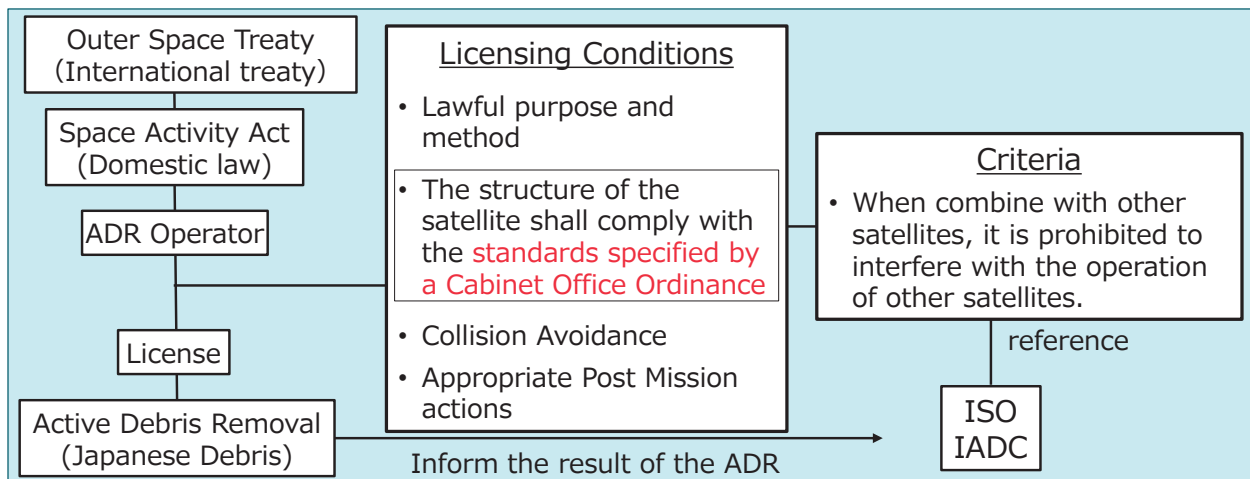
To secure the safety and a clean environment at the outer space

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## Current Legal System in Japan

For ensuring the mission safety and licensing the activities, new technical standards and certification system for the safety are required.



Source: Presentation by Yasushi Watanabe at 1<sup>st</sup> meeting of the Study Group, modified and translated by Akihiro Iwaki

## THE RESEARCH PROJECT



Practices in analogous areas (ex. law of the sea, law concerning disaster)



Practices in other countries



Private initiatives

## THE LEGAL PROBLEMS OF ADR UNDER PUBLIC INTERNATIONAL LAW

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### RELEVANT ISSUES



The Ownership and Jurisdiction



Standard of the ADR



International Cooperation

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## DEFINITION OF DEBRIS

Space debris are all man made objects including fragments and elements thereof, in Earth orbit or re-entering the atmosphere, that are non functional. (IADC Guideline, 2007)

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## THE OWNERSHIP OVER THE DEBRIS



The prevention of harmful interference with space activities



The state of registry

- The term "space object" includes component parts of a space object as well as its launch vehicle and parts thereof.

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## AN ISSUE OF THE OWNERSHIP AND THE JURISDICTION

State A conducts ADR against an object registered to State B



The conditions when State B may not be able to claim its jurisdiction against State A?



The doctrine of abandonment?

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## WHAT IF ADR CREATES ANOTHER DEBRIS?



Liability principle?



The calculation of the damage?

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## THE NEED FOR INTERNATIONAL COOPERATION

Designate the ADR target

Implement the ADR operations

Monitor the ADR operations

Allocate the ADR costs

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## POSSIBILITY OF AN INTERNATIONAL REGIME?



Information Sharing and Dispute Settlement



Dispute Settlement



International Funding for ADRs

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## A POSSIBLE SCENARIO

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Identification and formulation of legal systems for supporting the ADR

### Domestic level

New technical standards and certification system for Safety are required



### Bilateral level

Common technical standards and certification system for Safety are required



### Global level

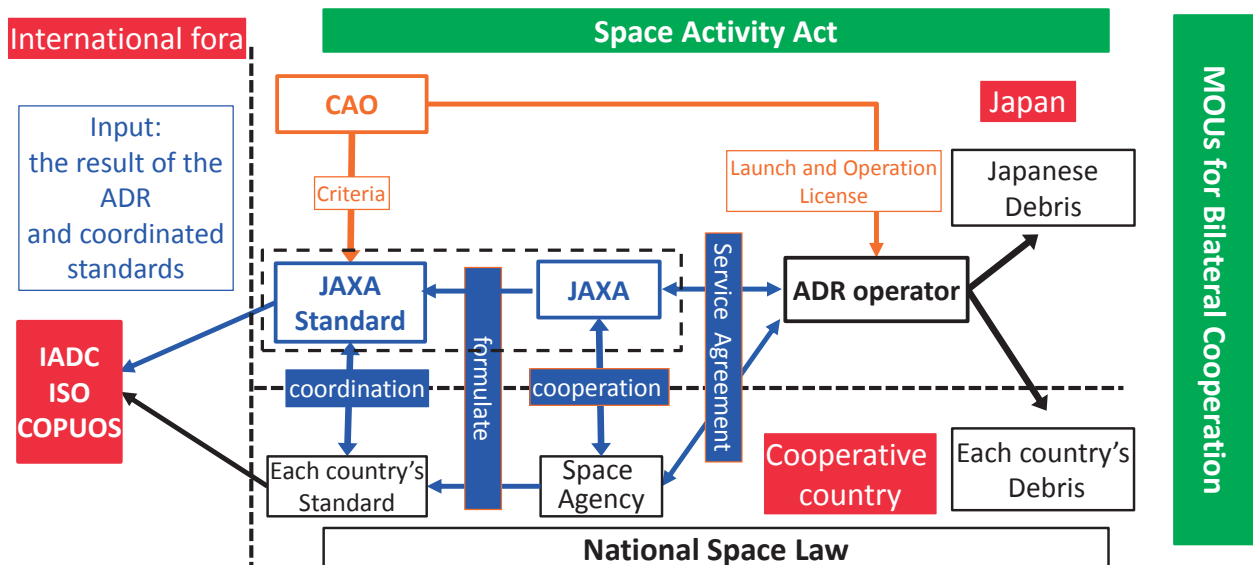
Global technical standards and certification system for Safety are required

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## Identification and formulation of legal systems for supporting the ADR

- Hypothetic model for mutual allowance and certification



Source: Presentation by Yasushi Watanabe at 3<sup>rd</sup> meeting of the SG, modified and translated by Akihiro Iwaki

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## CONCLUSION

### The need for common technical standards

- To secure the environment of the orbit.
- To promote industrial development.

### The challenges for establishing international rules

- The difficulty in establishing a new treaty.
- The merits and disadvantages of soft-law rules.

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