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Space Industry Workshop Report

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UNIDIR UNITED NATIONS INSTITUTE FOR DISARMAMENT RESEARCH

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ABOUT UNIDIR

UNIDIR is a voluntarily funded, autonomous institute within the United Nations. One of the few policy institutes worldwide focusing on disarmament, UNIDIR generates knowledge and promotes dialogue and action on disarmament and security. Based in Geneva, UNIDIR assists the international community to develop the practical, innovative ideas needed to find solutions to critical security problems.

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NOTE

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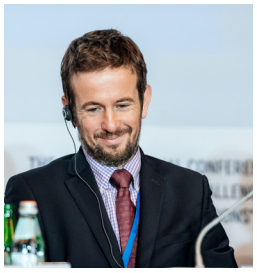

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INTRODUCTION

The space economy is currently worth over US$ 420 billion and continues to grow with each passing year in tandem with the space industry, which is responsible for approximately 80 per cent of the global space economy. Industry—both private and State-run—has a vested interest in maintaining peace and security in space.

Industry can actively contribute to shaping space security by providing States with valuable insight that could aid in the optimization of policymaking. Industry actors have a wealth of technical know-how and practical experience accrued through their day-to-day activities. Their perspectives should, therefore, be especially valued at this juncture as States pursue measures to govern activities and behaviour in outer space.

To facilitate engagement, UNIDIR and the United Nations Office for Disarmament Affairs (UNODA) co-organized a dialogue with industry. The first event took place on 26 August 2021 and aimed to explore industry perspectives related to space security, sustainability and safety, and to look at how the space industry can contribute to creating a peaceful and secure space environment.

The event brought together industry representatives from a diverse range of States with varying degrees of space industry and technological development. Participants addressed questions such as:

- What types of actions or activities do industry actors regard as threatening to their space systems and operations?
- What options are available to operators to detect and to identify threats to their operations?
- What do industry actors regard as irresponsible State behaviour in outer space?
- What measures should governments take to prevent any armed conflict from starting in or expanding into outer space?

To encourage free and frank discussion, the meeting was held under the Chatham House Rule. As such, "participants were free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed."

SESSION 1

THREATS AND RISKS TO SPACE OPERATIONS

During the first session of the roundtable, participants exchanged insights into the types of actions that they deemed to be threats or risks to space systems and operations. Participants identified the following as particularly concerning:

ORBITAL CONGESTION AND SPACE DEBRIS

Several participants pointed out that outer space is now more congested than ever before, with low Earth orbit becoming particularly crowded as a result of the increase in space asset launches. This congestion increases the risk of collisions and the creation of further space debris, which can pose significant danger to assets in space as well as the services that they provide on Earth. To this end, some participants pointed to the importance of adhering to established procedures, such as those related to deorbiting spacecraft, to preserve the environment. Participants noted that States have not always followed these good practices in the past.

UNCERTAINTY AND AMBIGUITY OF INTENT

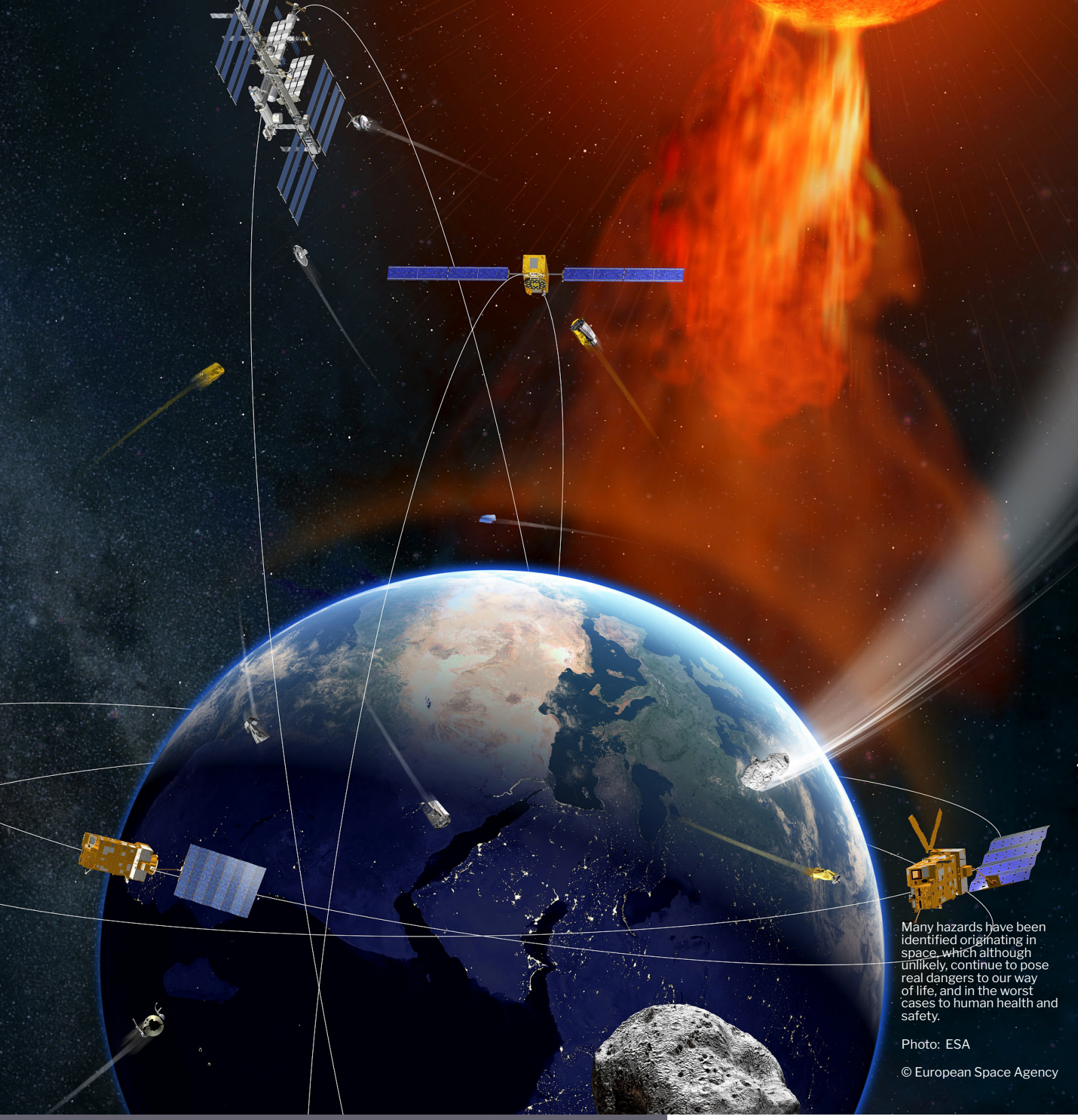
Some participants indicated concern over possible incidents resulting from rendezvous and proximity operations (RPOs). The ambiguity of intent behind RPOs means these operations are sometimes perceived as potentially hostile, which can create distrust and uncertainty among space actors. This lack of trust can affect revenues of commercial actors by undermining confidence in the ability of the satellite operators to protect their capabilities. One participant argued that RPOs should be not considered a threat in and of themselves. Rather, it is the behaviour behind their use that generates concern. A narrative that perpetuates the belief that RPOs are dangerous could hinder innovative activities in the future, including activities designed to enhance safety and sustainability in space.

INTERFERENCE

Some participants expressed concern over the potential for interference with satellite services and other capabilities. The development and use of interference technologies, such as jammers, was a particular concern, particularly as these technologies become cheaper and more accessible, even to non-State actors. Cyber threats, which can interfere with the services that satellites provide, are also growing. Indeed, cybersecurity has become a matter of major concern, and there is a growing interest among industry actors in working with States to improve cybersecurity in relation to ground stations and satellites.

LACK OF DATA-SHARING

Many participants expressed concern over the current inadequacies of information-sharing around space activities. Sharing of space situational awareness (SSA) data was identified as particularly important. It was proposed that operators should submit required information about their activities to the appropriate organizations. The lack of communication among space actors further complicates understandings around the intent behind operations. This is counterproductive and creates unnecessary risks. The lack of mechanisms to check the veracity of shared data is also problematic



Many hazards have been identified originating in space, which although unlikely, continue to pose real dangers to our way of life, and in the worst cases to human health and safety.

Photo: ESA

SESSION 2

MEASURES THAT INDUSTRY CAN TAKE TO MITIGATE THREATS AND RISKS

The discussion during the second session revolved around the measures that industry actors have put in place or could implement in order to avoid or to mitigate threats and risks to their space systems and operations. These measures include the following:

SHARING SSA DATA

Many of the participants reiterated in this session the importance of sharing SSA data. It was pointed out that some operators already do share SSA data, but such sharing should become a more widespread practice and subject to oversight by a civilian agency. Some participants proposed that an international SSA data hub could provide operators with points of contact for data sharing.

DOCUMENTATING ACTIVITIES AND GENERAL INFORMATION-SHARING

Several participants agreed that responsible practice requires operators to better document their activities. Some felt it is important that operators routinely monitor activities around their space assets and develop means to verify the data obtained. Furthermore, it was suggested that certain information, for example on space activities and mission planning, should be shared both with governments and the wider public. This information-sharing could be done through a centralized website or platform as well as through exchanges at regular events that allow for the exchange of information, as some of the participants do in their daily practices.

FOSTERING COOPERATION AMONG ACTORS TO SHARE EXPERIENCES

Participants generally agreed on the importance of cooperation among stakeholders. Past experiences in the field of arms control and disarmament have shown that it is difficult to regulate fast-moving new technologies and policy measures can rapidly become outmoded. Some participants felt the gaps between technology and policy have allowed many of the current tensions among space actors to arise. However, closer collaboration among actors to share information about activities or policies could help to build trust. Discussions between States and the commercial entities they host could also be useful to improve mechanisms that could contribute to this effort, such as the sharing of SSA data.

DEVELOPING AND ADOPTING MULTILATERAL SPACE POLICIES

Some participants drew attention to the competitive nature of the space industry and to the importance of an open and fair market. Some cautioned that space policies adopted unilaterally by a space power could affect the competitiveness of their domestic industries. Therefore, a multilateral approach to developing space policies is crucial. Multilateral policies would facilitate international information-sharing and would contribute to building trust among space actors in different countries.

A 7 mm-diameter circular chip in the ISS' Cupola window gouged out by the impact from a tiny piece of space debris, possibly a paint flake or small metal fragment no bigger than a few thousandths of a millimetre across.

Photo: ESA

SESSION 3

MEASURES THAT STATES SHOULD TAKE TO MITIGATE THREATS AND RISKS

In this session, participants identified several possible steps that States could take to mitigate threats and risks in space, including the following:

ENFORCING TREATIES

Some participants proposed that treaties related to outer space needed to be updated proactively to prevent undesirable developments. For example, it was suggested there is no global consensus on whether the exploitation of resources on asteroids or the Moon by private entities is allowed under the Outer Space Treaty. Nor is there clarity on the use of conventional weapons in space. As such, a multilateral process to discuss these issues is needed. Other participants highlighted the importance of treaty enforcement, with one participant emphasizing the value of coordination and cooperation among States to ensure that private actors within their jurisdiction comply with international norms and agreements.

ENHANCING SPACE SITUATIONAL AWARENESS

Several participants raised the issue of sharing SSA data with industry actors (as discussed above). One participant suggested that States also need to discuss standards and best practices on coordination of activities and the timely sharing of SSA data. Such a step could enhance the ability of States and other stakeholders to track space objects for the prediction and prevention of collisions. The process could also facilitate the attribution of responsibility for incidents.

ADDRESSING SPACE DEBRIS

Several participants identified the imposition of limits on the intentional creation of debris as a potential solution for dealing with space debris. One participant suggested that a results-orientated discussion on space debris could be useful. Other participants variously suggested that States could play a role in a) financing the development of technologies to address space debris, b) supporting the clean-up of junk in outer space, and c) developing rules on debris generation and cleaning.

FACILITATING COMMUNICATIONS

Participants indicated that clear and open communication channels among States are important for better understanding space activities and intentions. Communication could also aid in de-escalation and in building a better understanding of dangerous pathways to escalation. Concern was expressed over the uncertainty surrounding escalatory pathways during times of tension; for instance, a State might respond to a cyber-attack on a space asset with the use of physical force.

ESTABLISHING A SPACE SUSTAINABILITY RATING SYSTEM

A few participants proposed further consideration of establishing a space sustainability rating system to provide metrics for sustainability among space actors. It was suggested that such a mechanism might encourage space actors to engage in more responsible behaviours in space.

SESSION 4

OPPORTUNITIES AND PROSPECTS FOR INTERNATIONAL GOVERNANCE

In the final session, participants discussed opportunities and prospects for international governance. During the discussion, the following points were raised:

ENHANCING INDUSTRY ENGAGEMENT

There was agreement on the importance of involving industry in the development of an international space governance regime, not least because, in some regions, the private sector operates far more space assets than the public sector. As such, it was argued that private actors need to be given an opportunity to engage in international discussions and that United Nations bodies could facilitate such engagement. One participant argued that industry had demonstrated the capacity to find solutions to space-related challenges involving debris, further indicating a preference for industry-led solutions rather than government-imposed regulations.

RECOGNIZING THE LIMITS TO INDUSTRY PARTICIPATION

An observation was shared that there had been hostility towards industry participation in some international discussions on space security-related issues for geopolitical reasons, as well as due to technical concerns. It was recognized that in certain settings, industry participation may be difficult; some companies may exercise caution in engaging because of concerns over alienating their customers.

LEARNING FROM OTHER REGIMES

Participants suggested that lessons could be learned from experiences of industry engagement in other arms control or disarmament regimes. The successful example of engagement between officials and industry actors in creating and maintaining the Chemical Weapons Convention was identified as one possible model to explore further. The United Nations Convention on the Law of the Sea was also identified as another treaty that could provide useful lessons to be learned for further steps towards space security. The Treaty on the Non-Proliferation of Nuclear Weapons safeguards regime was cited as a third regime from which the space sector could learn, particularly in terms of verification. However, it was indicated that, despite all the developments in SSA, verification of weapons needed to be undertaken prior to the launch of space assets, otherwise it would be too late.

MOVING QUICKLY

At several points in the discussion, participants underlined the speed at which space-related technologies are evolving. Accordingly, participants felt that measures to better regulate space and to improve transparency and information-sharing need to be taken quickly.

MOVING FORWARD

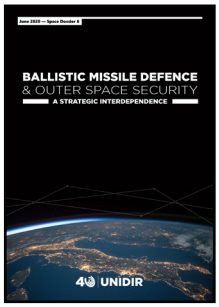
Space security governance cannot be achieved by States alone. The voice of the private sector is important to the development and optimization of policymaking for space security governance. Indeed, industry can provide a novel perspective due to their experience conducting space activities and operations.

The UNIDIR and UNODA Industry Engagement Workshop demonstrated the willingness of industry actors to actively participate in efforts to ensure that outer space remains a peaceful domain. It further showed the added value that an industry perspective could lend to the policymaking process moving forward. Industry actors and States generally agree on what constitutes a threat to space security. Issues such as space debris, counter-space technology, and interference with space services were highlighted by both industry and States as issues of concern. When it comes to mechanisms to mitigate these risks, industry can play an important role in identifying and applying novel ideas.

Initiatives such as the Industry Engagement Workshop help to bridge the gap that has traditionally existed between industry actors and States in relation to space security matters. These initiatives also serve to call attention to the reality that all actors in space have a shared interest in keeping space a peaceful and secure environment for all.

The United Nations is well-placed to encourage further engagement between States and the space industry in order to facilitate the pursuit and fulfilment of the Secretary-General's Disarmament Agenda and, more generally, to maintain peace in outer space. UNIDIR and UNODA will continue to facilitate this engagement by providing forums for industry actors to share their views on space security with the international community.

RECENT UNIDIR PUBLICATIONS RELATED TO SPACE SECURITY



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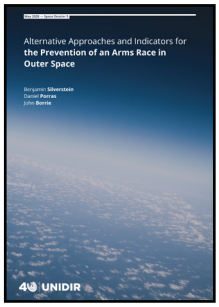

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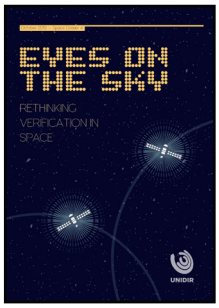

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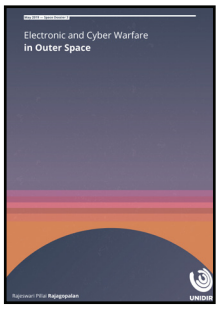

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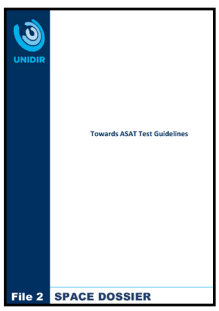

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