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Wilton Park

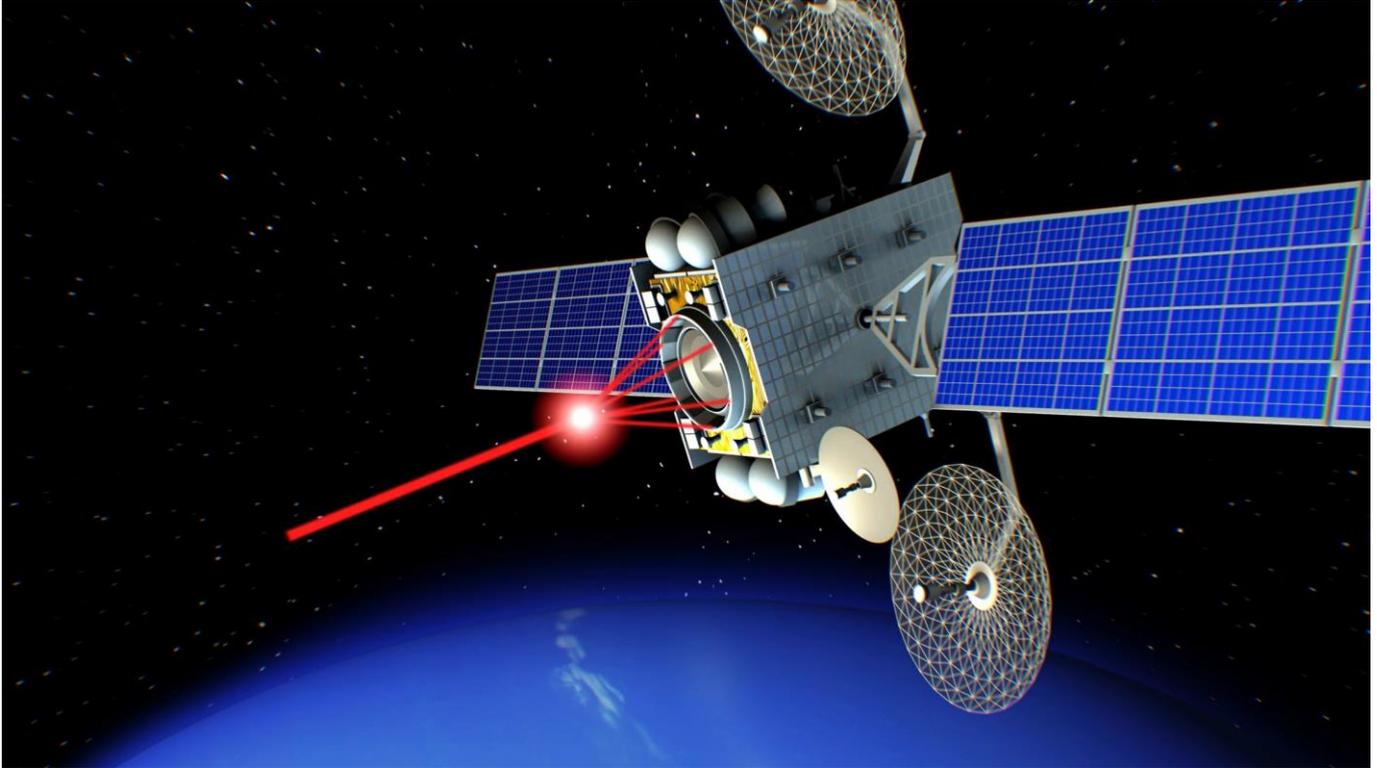


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Report

## Operating in space: current multilateral policy issues and challenges

Held by Zoom videoconference

Organised in partnership with:





## Report

# Operating in space: current multilateral policy issues and challenges

Monday 6, Wednesday 8 and Friday 10 July 2020 | WP1796V African region

Monday 13, Wednesday 15 and Thursday 16 July 2020 | WP1796V Central Asia and Middle East including Eastern Europe region

Monday 20, Wednesday 22 and Friday 24 July 2020 | WP1794V GRULAC region

In association with the Department of State, United States of America and Secure World Foundation

## 1. Executive summary

### 1.1 Conference rationale

As technology continues to advance and costs fall, the use of space is growing. However, greater use brings increased risks associated with congestion, such as the proliferation of satellites, and competition between states. Keeping space safe and sustainable depends on clear communication, be it directly, through clarifying intent, or demonstrating responsible behaviour in space. In July 2020, Wilton Park convened three, three-day virtual conferences to discuss risks and threats to space systems and how to mitigate them through increasing engagement and transparency. These conferences, sponsored by the UK Foreign and Commonwealth Office, the U.S. Department of State and the Secure World Foundation, follow on from the March 2019 Wilton Park conference and the January 2020 conference in Singapore which addressed multilateral policy issues and challenges of operating in space. The July 2020 events brought together policymakers from African, Central Asian, Middle Eastern, Eastern European, Latin American, and Caribbean nations with a mix of outside experts to build upon the outcomes from the Singapore conference.

### 1.2 Representation

A total of 88 representatives from 38 states across the African, Central Asia and Middle East including Eastern Europe and the Group of Latin America and the Caribbean (GRULAC) regions: (Angola, Argentina, Australia, Bahamas, Bahrain, Barbados, Belarus, Brazil, Cameroon, Canada, Chile, Colombia, Costa Rica, Côte d'Ivoire, Dominican Republic, Ecuador, Egypt, France, Ghana, India, Iraq, Israel, Kazakhstan, Kenya, Latvia, Madagascar, Mexico, Morocco, Namibia, Nigeria, Paraguay, Peru, South Africa, St Kitts and Nevis, Turkey, Ukraine, United Kingdom, and the United States of America) participated in the conference, as well as representatives from non-government organisations, intergovernmental organisations, and industry.

### 1.3 Discussion focus

The discussion focused on means of improving transparency, communication of space activities and other confidence-building measures as ways to reduce emerging risks and security issues. While there are some multilateral mechanisms and procedures in place, the discussion addressed expanding and leveraging these to improve engagement and collaboration between states. Many agreed the necessity of engaging in the multilateral conversation and participants brainstormed solutions to enhance capacity-building opportunities that would improve transparency between all.

### 1.4 Key questions considered

- What Earth-based or space-based threat to space operations do you think is the most pressing and why?
- What collaborative measures and actions would reduce the perception of threat from space-based and Earth-based activities/operations?
- What communications or other transparency measures would serve to clarify our intentions before we act in space?

### 1.5 Key take-aways

- Regardless of the approach, participants recognised that more could and should be done to address current and evolving safety, security and sustainability concerns in space.
- As all states are dependent on space, the security and stability of space is a common concern, so it is vital for all spacefaring and non-spacefaring nations to engage in these conversations.

- To have productive conversations, it is vital to have an inclusive process to centralise and exchange information for building dialogue and trust among the space community. As noted, sometimes the opportunity for discussion is more important than concluding an answer.
- To bring all actors to the table, a greater understanding among and within states is necessary. This may require education and capacity building to increase nations' confidence and ability to engage.
- Space-faring nations should focus on sharing information and intentions to build greater transparency among actors and to help reduce possible risks or future conflicts due to misunderstandings.
- Responsible behaviours may not regulate activity in space as well as legally binding measures, but with collaboration, political will and by building trust and a framework for dialogue, responsible behaviours could form the basis for regulation or feed in to a process to establish legally binding measures. Responsible behaviours have allowed candid discussions and implementation of measures and adapting to rapid changes in technologies and risks.
- A draft UN resolution on responsible space behaviours was presented by the UK and made available for states to contribute their ideas.

## **2. Wilton Park and space issues: work done to date**

### **2.1 Wilton Park, March 2019**

Wilton Park convened a conference in March 2019 on operating in the outer space environment and addressing emerging challenges by developing standards of responsible behaviour. The 45 representatives from 13 spacefaring states came together to examine four key areas: launch activities, debris mitigation and management, space situational awareness (SSA), and in-orbit and proximity operations. Participants considered practical measures the international community could adopt to promote closer cooperation between governments and the space industry. Takeaways focused on space rapidly commercialising and democratising, requiring transparency, responsibility and data sharing by both state and private actors.

### **2.2 Singapore, January 2020**

Wilton Park convened a second conference in January 2020 held in Singapore. 47 representatives from 18 Indo-Pacific nations discussed current multilateral policy issues and challenges of operating in space. Discussion focussed on the role that clear and effective communications could play in reducing threats in space resulting from the unknown behaviours or intents of another spacecraft. Participants considered appropriate protocols and mechanisms that could enable improved communication between operators (state and private) and governments to reduce the perception of threats. They suggested that awareness raising would provide a stronger foundation for efforts to define standards of responsible space behaviours. Participants considered that the existing patchwork of multilateral, regional, and bilateral arrangements for space communications is inadequate for the evolving space environment. One solution considered establishing an international database for space objects to facilitate real time communication between operators.

### **2.3 Virtual Events, July 2020**

Three events were held virtually, in July 2020. Each event was held over three days across three separate weeks. Representatives from different regions attended each week, with the division being Africa, Central Asia and the Middle East (including Eastern Europe), and GRULAC regions. These events sought to build upon the themes and outcomes from the first two conferences, and brought together a mix of experts with technical, policy, and governmental backgrounds to meet with government officials from a range of nations across each region. The structure of the events allowed for interactive conversations with speakers and among participants via discussion groups. Each session gave participants the opportunity to share observations and reflections. The first day focused on understanding the current threats and issues in space. The second day addressed possible solutions with participants working together in virtual breakout rooms to suggest opportunities for collaboration. The final day analysed the current state of discussions in multilateral fora and looked ahead to the next steps for moving the conversation forward.

## **3. Setting the scene**

### **3.1 Increasing reliance and increasing challenges**

Space-based systems play an increasingly vital role in facilitating day-to-day functions of governments, businesses, academia and individuals in all nations, including those yet to develop their own spacefaring capabilities. Space-based systems underpin a wide range of civil and military activities from navigation to banking, which can be vital to the global economy. This needs to be taken into consideration when discussing how to behave responsibly in space. It is therefore in the interests of all nations to ensure that space remains a safe, secure and sustainable environment. However, the risks of orbital congestion and space debris, as well as the threats from counterspace technologies or uncertainty about orbital behaviours, continue to multiply. The significant and ongoing increase in the number of space objects has meant

that orbits are becoming more congested, increasing the risk of collisions. There is greater commercial and political effort to actively track, monitor and remove debris but the scale of the problem means this will remain a challenge into the future. The Singapore and virtual events demonstrated the high fidelity understanding of space activity enabled by SSA technology. SSA continues to be constrained by reluctance to share data and the time delay in space-earth-space decision-making but allows operators to predict potential collisions and monitor proximity operations. Growing SSA capabilities mean that manoeuvres rarely occur without being observed. In addition, nations are developing potential dual use and counterspace technologies implying some satellite-to-satellite encounters could be perceived as hostile.

### **3.2 Threats to space systems**

Threats may be space-to-space, space-to-ground or ground-to-space. There needs to be acknowledgement that threats are not just in space and that space is part of a much larger economic, societal and military system of systems that rely upon each other, therefore space needs to be included in all security questions. Capabilities include signal jamming and dazzling, anti-satellite kinetic systems both earth-based and in orbit. Currently, only non-kinetic capabilities have been used in military operations with cyber the most common. However, kinetic anti-satellite technology has been tested. The potential dual-use nature of a number of space platforms may cause them to be seen as a threat, and rendezvous and proximity operations, such as close approaches and unconventional orbital manoeuvres, can be perceived as threatening when it is difficult to establish the intent.

Analytical Graphics Inc. (AGI) illustrated what can be seen from the ground, including proximity operations. AGI's illustration demonstrated the utility of SSA in identifying potential dangers such as collisions as well as the challenges of interpreting space object behaviours including, satellite visiting, orbit matching, rendezvous and proximity operations and active debris removal (ADR), all of which can lead to misperceptions and incorrect actions taken. For example, if a satellite changes its inclination and speed to match the orbit pattern of another satellite without communication, this could be perceived as a threatening action. Such a manoeuvre could be to avoid a collision or to aid the second satellite, however if there was no communication of intent, to an onlooker, this could be viewed as a potentially unfriendly act.

AGI estimates that 107,000 satellites will be in orbit by 2029. Although many of these ventures will not be successful, a fraction of this figure still represents a significant increase requiring increased space traffic management and understandings of space object behaviours and improved communication between owners, operators governing bodies.

### **3.3 Reducing the perception of threats to space operations**

As tensions increase, the risk of misunderstanding or miscalculation between operators increases. The challenge of verifying a space object's technological capabilities, including potential dual-use technology, led some to argue for conversations around intent versus the nature of technology. Participants suggested that transparent conversations to understand intent are vital to de-escalate potential threats and that maintaining open and collaborative dialogue explaining actions builds trust.

### **3.4 Acknowledging the need for responsible space behaviour**

Given the escalating risks and threats to space systems, the international community has recognised the increasing urgency to intensify the dialogue on responsible space behaviours. While some saw responsible space behaviours and legally binding measures as distinct, others saw responsible behaviours forming a basis for trust, discussion, agreements and future legally binding measures; it was noted that non-binding does not constitute non-legal as countries may codify the responsible behaviours in their legal systems and make them nationally binding to state and private actors. Some expressed concern that these behaviours might be written to the benefit of some, others countered that responsible behaviours should not be imposed but rather evolve through users' actions and preferences. Responsible space behaviours must be built through transparency and confidence building measures and should be adaptable to technological change.

### **3.5 Committee on Peaceful use of Outer Space (COPUOS) and long-term sustainability guidelines**

In June 2019 COPUOS adopted by consensus 21 guidelines for long-term sustainability (LTS) in outer space. The guidelines focus on four areas: policy and regulatory framework; safety in space operations; international cooperation and capacity building; and scientific and technical research and development. The LTS guidelines do not deal with national security concerns however, COPUOS sees safety as paramount and universal, and potentially aligning civilian, military, private and state actors in addressing issues. The guidelines are voluntary and non-legally binding. They provide the foundation for nations to set up a sustainable space program. A key step in building capacity and encouraging policy makers to prioritise space safety, security and sustainability is increasing awareness of the LTS guidelines. The Committee also set up a working group to develop the guidelines to meet future challenges.

### **3.6 The challenges of regulation and utility of responsible space behaviours**

Space threats may be visible or non-visible, space-based or earth-based, justifiably or unjustifiably perceived as a threat and challenging to verify. In addition, it is becoming harder to regulate technologies and the pace of technological change may make specific regulations of limited durability. However, some participants suggested that more generic existing laws such as the Law of Armed Conflict could be interpreted for behaviours in space. Further, parallels could be

drawn between responsible behaviours at sea and in space. Indeed, some safety conventions such as red 'port' and green 'starboard' lights are already used in space. It was suggested that these challenges are best addressed by agreeing and adopting responsible behaviours rather than regulations which may provide behavioural and technical thresholds which could easily be exploited, and which could introduce prohibitive barriers to participating in space activities. However, multilateral and demonstrable responsible behaviours may encourage reluctant states to be more transparent as an obligation and right to contribute to the common good.

## **4. Challenges to be addressed**

### **4.1 The risks and threats of increased congestion, potential dual use and counter space technologies**

Space is becoming more congested, increasing the potential for concern and misunderstanding of actions. Added to this, continuing development and testing of space weapons increases threats to operating in space and the potential for conflict on Earth to extend into space. Participants noted that due to their lower threshold for use, electromagnetic and cyber warfare presented the most likely threat. Given the potential dual-use nature of some space technology, it has become more difficult to define which technology constitutes a weapon. Concerns were raised regarding how to best consider dual-use technologies when understanding and developing space security. Therefore, it was argued that it might be more productive to focus on what behaviour rather than technology constitutes a threat.

### **4.2 Understanding intent and actions to mitigate risk and understand potential threats**

There is insufficient understanding of the intentions of some actors, resulting in a reduced sense of safety and security. Participants noted that understanding intent was important to understand the difference between benign and hostile actions. Misunderstandings may manifest differently in diverse contexts. For instance, a satellite with the capabilities of using a harpoon to capture debris, may be interpreted as having anti-satellite capabilities. Equally, proximity manoeuvres or shadowing operations without communicating the intent could be misunderstood as interference operations or a threatened attack. However, intent may rapidly change, and therefore like the difficulty in measuring technology as a threat. Therefore, transparent conversations around responsible behaviours could lead to greater confidence in actions and avoid misperceptions, increasing security and safety for all as many actions in space affect the global community.

### **4.3 States have varying capacities to engage in multilateral discussions**

The democratisation of space has meant that there is an expanding group of spacefaring nations. While not all states may have spacefaring capabilities, there remains a shared interest to act responsibly in space so that all existing, emerging and non-spacefaring states can still benefit from space. However, many countries feel either left out of the debate or that they should not participate because they are not major space actors. Some participants raised the question of how to convince high-level decision makers that as a non-spacefaring nation, they should be in the conversation. This led to a discussion of designing a successful international process. While consensus approaches in multilateral fora have allowed for in-depth and collaborative discussions, some noted that requiring consensus may also present obstacles and close discussions when others invariably disagree. This led participants to consider the effects and importance of the venue and rules of procedure for creating a productive dialogue.

## **5. Improving communication and transparency**

Discussions focussed on the contribution transparency measures and effective communication could make to ensuring space remains safe, secure and sustainable. Participants agreed current arrangements for communications are insufficient for the rapidly evolving space environment. Improving transparency and communication mechanisms would be equally important for space activities in normal times, as well as in times of stress. Broadly speaking, discussions coalesced around the following key themes and concepts. Careful consideration of these themes could inform and guide international dialogue:

1. Engaging all non-spacefaring and spacefaring actors in collaborative dialogue
2. Enhancing collaboration through awareness-raising and capacity building
3. Possible solutions for bettering transparency and collaboration such as designing an international platform for quick communication around actions and intentions or building responsible space behaviour

### **5.1 All nations and actors must engage in international and collaborative conversations**

Space is a global resource and as such, its safety, security and sustainability concern us all; all states could be adversely impacted in the event of an accident or conflict in space. It is therefore vital to include commercial, state, civil, and military space actors in conversations to ensure universal collaboration and engagement in solutions. Likewise, all states, whether spacefaring, emerging or a non-space actor, must be able to engage in the dialogue and contribute to solutions that will affect the universal community. To take this concept a step further, the global conversation requires participating actors to fully develop a common conceptual understanding of safety, security, and sustainability. Many participants noted that in various languages the words used, or concepts of safety and security could be quite different

from those understood in English. This effort would require all users to strive for a better understanding of how these concepts relate to long-term goals of global prosperity in space.

## **5.2 Enhancing communication through awareness-raising and capacity building**

International dialogue on responsible space behaviours consistently highlights the importance of improving transparency. This flows from the fact that many perceived threats to space systems are borne from a lack of understanding of other operators' intentions. To reach the level of communication needed to mitigate these concerns, it is vital to raise awareness of the daily uses of space through education and capacity building for both the public and policymakers. This could be mitigated by further workshops and seminars, cooperation through joint civil space missions and activity within regional organisations.

## **5.3 Preliminary steps for improving communication and transparency measures**

Participants proposed four preliminary steps or initiatives that could be taken forward by the international community to develop greater security, safety, and sustainability for all current and future actors. These steps were deemed necessary to increase engagement in global dialogue about space safety, security and sustainability for increasing transparency overall.

- 1. Demonstrating intent in outer space.** Communication is a key solution to understanding the intent behind the behaviours of objects in space. This is particularly needed to reduce the risk of collisions and misperceptions of threats. Sharing SSA data can help understand the behaviours of objects and enhance trust between space actors.
- 2. Bridging of communication between all space operators.** In various instances, the ability to bring actors together for dialogue was vital. Creating opportunities for conversation can lead to greater transparency and confidence-building measures (TCBMs). Many participants asked if states could have open access to SSA information to increase knowledge and reduce risks or misperceptions. This may go hand in hand with sharing information on satellite capabilities, and more importantly, intentions. Providing information on planned manoeuvres and cooperating in space traffic management tasks may allow for more productive and safe communication between all actors.
- 3. Developing a universal platform for conversations.** There was a consensus among participants of the need to address immediate concerns or inconsistencies in space behaviours that may result in misperceptions or conflicts. Ideally, dialogue would allow for communication on sharing manoeuvres and other actions while giving the opportunity for others to ask questions. An international forum for state and non-state actors was discussed as a confidence and transparency measure for enhancing trust in the peaceful use of space. Some representatives noted that their respective countries needed a simpler system of registration to communicate when their country is launching a satellite and what they are planning to do with it. This might also serve as part of the international platform or notice system. Overall, many felt that there was currently no formal mechanism to address inconsistencies in actions and advocated for a platform to mediate, arbitrate, or simply discuss these issues.
- 4. Developing responsible space behaviour.** Responsible space behaviours can provide a foundation for cooperation and capacity building, data sharing and protection, transparency, better understanding of intentions and a conflict resolution mechanism. They allow greater flexibility in implementation and avoid some external political structures but allow all actors to be included in the discussion as they are developed and agreed. The work at COPOUS in creating new guidelines for the long-term sustainability of space is invaluable for demonstrating responsible behaviour. These guidelines have made substantial progress in part because they are not legally binding, enabling candid and in-depth discussion. Additionally, voluntary commitments can constitute the basis of the legally binding treaties, regulations and measures that may be put in place in the future.

## **6. Reflections**

There was a consensus that more could and should be done to address current and evolving safety, security and sustainability concerns in space.

All nations are dependent on space, therefore the security and stability of space is itself a common concern, so it is important for all spacefaring and non-spacefaring nations to engage in the conversation. To bring all actors to the table, greater awareness and understanding among space actors is necessary. This may be through education and capacity building to reduce the vulnerability felt by many nations in participating. Participants acknowledged the need for regions to collectively work together to build capacity and collaborate on standard responsible behaviours.

Working collaboratively, states should focus on sharing information and intentions, generating transparency to build trust and to reduce risks and misperceptions. Among the participants, there were three schools of thought:

1. Responsible space behaviours provide a foundation for cooperation, capacity building and transparency. They allow flexibility in implementation and avoid some external political structures, while allowing all actors to be included in the discussion as they are developed and agreed.
2. Responsible space behaviours do not satisfy an ultimate need for rules governing actions.
3. While responsible space behaviours have allowed many to take more immediate measures towards rapidly changing technologies and risks, they should be linked to future legally binding measures.

It is evident that the unpredictable behaviours in space will continue to lead to perceptions of potential threats unless alleviated through enhanced communication of intentions and actions. An international platform for dialogue is vital to centralise and improve dialogue, exchange information, increase transparency and build trust; sometimes the opportunity for dialogue is more important than focusing on an answer.

**Kaila Pfrang and Megan Trichler and Jordan Aitken**

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