Official proceedings of ESA Security Conference
Space for European Security Policies

ESRIN, Frascati, Italy
4-5 November 2021

THE CONFERENCE: The **ESA Security Conference: Space for European Security Policies**, chaired by ESA Director General Josef Aschbacher, took place on 4-5 November 2021 in ESA's ESRIN Centre in Frascati, Italy. The Conference was co-organised by the European Space Agency (ESA) and the European Space Policy Institute (ESPI) with the objective to bridge the gap between space and security stakeholders to discuss, together, how to further enhance the role of space solutions in support of national and European security policies.

To do so, users of space solutions from the security field (operational actors), national and European public actors as well as representatives from European industry convened in ESRIN to share their respective experience on the contributions of space to face security challenges and to discuss possible future steps to better support security missions with space solutions.

The Conference gathered more than 100 participants with a varied set of backgrounds, coming from institutions and organisations from 13 ESA Member States and Associate Member States, alongside representatives of various European agencies and institutions as well as international organisations.

THE RATIONALE: Space systems have long and repeatedly demonstrated that they provide unique solutions to support a variety of security missions, from monitoring to action. Although the singular added value of space solutions is now more broadly understood and exploited by security users, the emergence of new security challenges[1] for Europe and the fast development of new space solutions are raising the stakes both for space and security stakeholders to ensure that space can support security missions to its full potential.

THE PROCEEDINGS: **This document provides the official Proceedings of the Conference**. These Proceedings outline the key messages raised during the two days of the event, which included five panel discussions and several keynote and thematic speeches. Recalling the "Chatham House" rule of the Conference, the Proceedings do not provide the source/s of provided information.

These Proceedings are structured around six main messages that were identified during the Conference and provide insights into the discussions and opinions that were shared, namely:

- *Space assets provide essential capabilities and added value for users tasked with security missions*

- *Security users still have unserved needs and face difficulties in adopting space solutions*

- *The protection of space assets is a necessary condition*

- *A common vision on the role of space in support of security policies in Europe is highly desirable*

- *A suitable framework for cooperation and coordination is needed to move ahead*

- *In this context, ESA is ready to take its share of responsibility, in line with Member States needs and in strict compliance with its mandate.*

ESA and ESPI would like to warmly thank all Conference participants, in particular keynote speakers and panellists, who fuelled the discussions with their valuable insights, informed views, and rich experience.

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[1] Conference discussions have underscored that the scope of the term "security" is rather broad and its meaning varies from one stakeholder to another. While clarification and convergence towards common understanding is highly desired, Conference discussions highlighted the current vagueness of the term should not be a barrier for future action. To guide future efforts, ESA Director General suggested security should basically mean *"the protection of our citizens, our values, our societies, our essential activities and supplies"*.

1. Space assets provide essential capabilities and added value for users tasked with security missions

Following welcome addresses and a presentation of ESPI reports on Space for Security, the Conference started with two user-focused panels, exploring practical use cases and discussing the needs, requirements, challenges and limitations faced by operational actors when using space solutions.

The discussions underlined that security actors conduct a wide variety of different missions (emergency management, critical infrastructure monitoring, support to civilian and military operations, investigations on mass crimes and infringements of human rights) with different operational frameworks and environments leading to different needs and requirements. However, presentations revealed convergence on the usefulness of space solutions to support rapid response and on the wish to facilitate the integration of space capabilities into users' operational environments.

Operational actors also highlighted that space provides unique benefits to their security missions. They presented various concrete use cases where space makes a tangible difference and contribute to the effective, timely and successful conduct of their missions.

When further elaborating on the specific added value of space solutions, panellists underlined the large size of the areas that space assets cover, the speed to collect or convey information and the possibility to obtain intelligence while circumventing specific operational hurdles (e.g. no need to request authorisation from a state to fly in its airspace). Some users highlighted that space assets can provide more cost-effective solutions as compared to ground-based alternatives, while others underscored their ability to forecast specific events. Several speakers also recalled that the added value of space data has become increasingly appreciated during the COVID-19 pandemic.

The discussions among users also reflected on the evolution of technologies and services in the space sector (e.g. constellations of small and cheaper satellites or subscription-based services). It was noted that this evolving landscape opens new avenues for space solutions to support security missions.

In parallel, some representatives underlined that the priority is to respond to user needs, and not necessarily to focus on a specific technology. Therefore, enhancing complementarity between space and non-space assets is key. Similarly, space technologies, data and services should integrate the requirements of different types of users, including the security community, from the development phase.

Finally, it was underlined that, even though all space technologies have security-related applications, irrespective of their initial design and purpose, the potential of space remains largely untapped, as a result of a number of barriers of adoption.

2. Security users still have unserved needs and face difficulties in adopting space solutions

Fostering "space for security" will significantly depend on meeting user needs and adapting space solutions to better fit security users' operational environments and challenges.

For what concerns "technical" requirements, users pointed out the need for increased responsiveness (e.g. revisit rates for EO services). They also stated that increased volumes of data and their fusion with other sources will create a major need for high-performance big data analytics, enabled by powerful IT technology, cloud solutions or artificial intelligence. In addition, the importance to optimise data collection, data processing and data transmission was pinpointed, as each of these steps is part of the value chain from sensor to end users, that is, from payload to action.

One recurring issue towards greater adoption is the uneven awareness across the security community. There is a need to sensitise end users, to clarify what space technologies can and cannot do. Interestingly, operational actors and policy stakeholders shared different assessments, some of the latter asserting that the benefits of "space for security" are well-known within their community, while several representatives of the former group were more sceptical.

Overall, knowledge and understanding are not the same across organisations and countries; therefore, the more experienced actors could serve as models for the others. Invited users also noted there are still some challenges regarding availability of data and services or, for some, cost of access.

Conference participants emphasised that using space solutions is often costly in terms of time and allocation of skilled workforce for the completion of demanding tasks. Therefore, it was also argued that further steps should be taken to reduce these burdens. This can be achieved by making the integration of space solutions into users' operational environments faster, simpler and more intuitive (e.g. through better access to pre-processed imagery and web-based tools). However, they also reminded that, despite this technological progress, the involvement of humans in the loop, with relevant experience and adequate training, remains essential.

A clear identification of user needs is also key to support the process of targeted innovation and diffusion of space technologies in the security domain. Industrial actors, for example, raised this point during the Conference, arguing that better visibility in users' expectations will enable industry to better organise R&D efforts. Industrial views on the expanding use of space in support of security missions also pointed out a major change of paradigm, that customers increasingly seek solutions, rather than infrastructures. It leads the industry to dedicate more efforts to translate such preferences into technical elements.

3. The protection of space assets is a necessary condition

Despite focusing on the use of space for security activities on Earth, many Conference participants also addressed the topic of security *in* space and emphasised the close relation between both. If we are vulnerable in space, we are vulnerable at large.

It was recalled that to ensure security *from* space, the security of space assets is essential so that the provision of their services is ensured. Moreover, societies and security actors increasingly rely on space assets while, at the same time, the space environment is becoming more and more unstable.

Panellists asserted that, faced with this evolving context, European actors could do more to ensure the protection of their assets, which should become a priority. In particular, speakers called for regulations and strategies to be implemented on the topic of security *in* space in order to avoid the negative consequences of the current growing geopolitical rivalry.

Finally, one key word of the Conference on this topic was the term "resilience". A vast majority of the speakers emphasised that the continuity of space-based services can only be ensured through resilient space systems. Operational actors identified resilience as one of their increasingly relevant requirements. Resilience can take different shapes and could be present at various segments of development and operations: in systems, platforms, but also in products. Three main advantages of enhancing resilience in space were mentioned:

- Mitigating the potential risks and threats to European assets
- Safeguarding the freedom of access to space services
- Preserving the functioning of the economy

4. A common vision on the role of space in support of security policies in Europe is highly desirable

Improving the uptake of space solutions by operational actors as well as the protection of space assets is not enough to strengthen the bond between the space and security domains. A large majority of Conference participants clearly stated that designing a vision, at political level and in a European perspective, will be key.

It was recalled that the reflection on the future role of space for Europe should focus on the "what" (objectives) and not be hindered by complex debates on the "how" (means).

Industrial speakers underscored that this reflection should address the role of space industry in national security. It was emphasised that, in the United States, having a capable space industry is considered as an integral element of national security. Therefore, if a similar vision is valid in Europe, measures must be taken to implement it, even if they come at a cost (e.g. European launch preference for national security payloads).

In this respect, industrial actors called for the elaboration of a strong vision, strategy and R&D roadmaps, which would facilitate their decision-making processes. However, it was also asserted that this vision should be based on top-down political decisions and not only on independent bottom-up initiatives.

5. A suitable framework for cooperation and coordination is needed to move ahead

To operationalise the aforementioned vision and better meet user needs, the exchanges that took place during the Conference called for more cooperation among stakeholders of the space and security sectors. In short, initiatives and policies related to space for security should be addressed in a more transversal, holistic, coordinated and consistent manner. The collective approach is key to foster sovereign ambitions and to master the rules, including legal and regulatory matters.

When discussing European cooperation, it was noted that three specific layers, sometimes sources of difficulties, should be considered:

- **National/European:** cooperation and coordination are essential between both national and European organisations, but it was recognised that there are also challenges to implement joint efforts. For instance, the need to reconcile the national sovereignty dimension of security with the cooperative nature of European efforts was particularly emphasised, noting that the frameworks for cooperation should be adapted on a case-by-case basis, depending on the sensitivity of the activity considered. In parallel, presentations of operational actors showed that cooperation is already a reality at this level, even though more could be done.

- **Public/private:** it was underscored that the relationship between public and private sectors has profoundly evolved, marked by a more prominent role given to industry and commercial solutions resulting from new public approaches. Industry representatives welcomed this change and pushed for it to continue. Among the measures suggested, the public sector could be an anchor customer and creator of a market of "space for security", taking part in the risk of private investments, it could better support SMEs to enter the security market; or, at European level, an economic diplomacy effort could be conducted to support European industry in third countries. The establishment of new innovative partnerships between private and public actors was also promoted by political leaders, who viewed it as a way to share the benefits of space with broader parts of society.

- **Civil/military:** the discussions highlighted that, today, the delineation between civil and military space domains is increasingly blurred. The audience was invited to consider space operations as a

spectrum including both civil and military dimensions and there were numerous calls for greater synergies between the civil and military domains. The relevance of dual-use systems was highlighted throughout the Conference, including by operational actors who consider them as an opportunity to increase the number of space systems they could leverage to benefit from and/or provide space solutions.

Overall, participants acknowledged that Europe is strong thanks to its community (ESA, European Commission, EUSPA, SatCen, EDA, Industry…), even though the multiplicity of actors may sometimes lead to a fragmentation of the European landscape. Cooperation, although desirable, should nonetheless avoid duplication. The objective of all stakeholders remains to foster complementarity and coordination, so that even more security actors can enjoy the benefits of space solutions, while keeping an appropriate level of efficiency.

6. In this context, ESA is ready to take its share of responsibility, in line with Member States needs and in strict compliance with its mandate

As a European and intergovernmental organisation, ESA has legitimacy to take part in cooperative endeavours in the field of "space for security", alongside other national and European actors.

First, over the years, ESA has established itself as an actor for the development of space-based solutions addressing security challenges, in a very practical manner. The Agency implements a number of projects related to security; it builds and deploys systems that uniquely contribute to the conduct of security missions. For instance, the Earth Explorer satellites allow to forecast emergencies, and the 4S and SAT-AIS initiatives foster the use of telecommunications systems for security purposes. Moreover, it was recognised that ESA can do more (e.g. providing end-to-end security), in particular in those security fields that were labelled as "uncontroversial" (e.g. disaster management). The need to act quickly is also of paramount importance.

Second, it was recalled that the objective of ESA is to rely on its technical expertise to support national and European policies and security actors, through the identification and filling of existing gaps. To this end, ESA will prepare, and is already preparing, optional programmes aimed at benefitting its Member States. Moreover, the Agency will make sure that its current and possible new security activities will fully integrate market and commercialisation dimensions, focusing among others on AI, Quantum technologies, semi-conductors and on-orbit robotics.

Finally, several political leaders supported the inclusion of "Safety and Security" as a pillar of ESA Agenda 2025. In line with this perspective, they expressed the need to create (more) synergies between national projects and ESA programmes on security. These statements were motivated by the fact that ESA was recognised as a unique forum for inter-governmental cooperation; an essential tool for shaping the industrial policy for the European space sector, ensuring a structurally adequate supply chain; and an enabler and promoter of cooperation for operational space applications systems for the benefit of its Member States.

Conference Programme – Day 1

4 November 2021

9:30 – 9:45	**Welcome: Simonetta Cheli, Director-elect & Head of Strategy, Programme, Coordination, EOP, ESA** on behalf of Toni Tolker-Nielsen, acting Director of EOP and Head of ESRIN
9:45 – 9:55	**Video Address: Josef Aschbacher, Director General, European Space Agency**
9:55 – 10:10	**Presentation of ESPI Studies on "Space in support of security missions":** Sebastien Moranta, Research Manager, European Space Policy Institute

10:10 – 11:40	**Panel 1 – Use Cases: Current Use and Constraints** • **Enrico Castioni**, Head, IT Traffic Monitoring and communications, Italian Coast Guard • **Eya Macauley**, Analyst – GIS/Remote Sensing, International Criminal Court • **Sorin Ducaru**, Director, European Union Satellite Centre • **Friedrich Teichmann**, Director, Geo-Spatial Institute, Austrian Armed Forces **Moderator** Gordon Campbell, Head of Enterprise, Directorate of Earth Observation, ESA
12:00 – 13:30	**Panel 2 – Use Cases: Future Needs and Evolution** • **Sonia Santos**, Senior Project Officer, European Maritime Safety Agency • **Konstanze Lechner**, Geo-Risks & Civil Security German Remote Sensing Data Center, DLR • **Wolfgang Roehrig**, Head of Unit Information Superiority, European Defence Agency • **Gilles Hoffmann**, Coordinator – emergency.lu, Ministry of Foreign & European Affairs (LU) **Moderator** Florent Mazurelle, Principal Security Strategy Officer, ESA
14:30 – 14:45	**Keynote Speech** **Amb. Claude-France Arnould, Special Advisor for European Affairs, IFRI** **Formerly: Chief Executive (EDA), Special Envoy for Space (EEAS), Ambassador of France**
14:45 – 16:30	**Panel 3 – R&D and Industry: Existing Capabilities and Innovative Concepts** **Thematic Speech** Xavier Pasco, Director, Fondation pour la recherche stratégique • **Miguel Angel Redondo**, Director of Business Development, Hisdesat • **Emmanuel Pajot**, Secretary General, EARSC • **Olivier Lemaitre**, Secretary General, Eurospace • **Wolfgang Duerr**, Head, Space and Security Applications Committee, BDLI • **Andreas Hay Kaljord**, Director Earth Observation, Kongsberg Satellite Services – KSAT **Moderator** Elodie Viau, Director of Telecommunications and Integrated Applications, ESA
16:30 – 16:45	**Closing Keynote Speech (Day 1)** **Manlio Di Stefano, Undersecretary of State, Ministry of Foreign Affairs and International Cooperation**

Conference Programme – Day 2

5 November 2021

9:30 – 9:45	Recap of Day 1: Pascal Legai, Senior Security Coordinator, Director General's Services, ESA

9:45 – 10:00	**Keynote Speech** Timo Pesonen, Director General, DG DEFIS, European Commission

10:00 – 11:30	**Panel 4 – Policy Implications: Drivers and Challenges to Cooperative Space for Security Initiatives** **Thematic Speech** Thomas Hoerber, Professor of European Studies, ESSCA • Gustav Lindstrom, Director, EU Institute for Security Studies • Nina Klimburg-Witjes, Post-Doctoral Researcher, University of Vienna • Stefan Soesanto, Senior Researcher, Center for Security Studies, ETH Zurich • Xavier Pasco, Director, Fondation pour la recherche stratégique **Moderator** Chiara Manfletti, Senior Advisor, Directorate of Operations, ESA

12:00 – 13:30	**Panel 5 – Policy Implications: Towards Future Space for Security Opportunities and Frameworks** **Thematic Speech** Olivier Zajec, Director, Institute of Strategic & Defence Studies, Université Lyon III • Carine Claeys, Special Envoy for Space / Head of Space Task Force, EEAS • Isabelle Duvaux-Béchon, Acting Head, Foresight, Strategy & Coordination Dept, ESA • Martin Juillard, Directorate for Economic Diplomacy, Ministry for Europe & Foreign Affairs (FR) • Johannes Kerner, Büro IV D 4, Federal Ministry for Economic Affairs & Energy (DE) • Luigi Riggio, Space & Aerospace Policies Unit, Presidency of the Council of Ministers (IT) **Moderator** Sebastien Moranta, Research Manager, European Space Policy Institute (ESPI)

13:30 – 13:45	**Final Keynote Speech** Gen. C.A. Luigi de Leverano, Military Advisor, Presidency of the Council of Ministers (IT)

13:45 – 14:00	**Closing Address** Josef Aschbacher, Director General, ESA

15:00 – 16:00	**Tour of ESRIN**