

Regionalisation of Space Activities in Asia?

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In recent years, the astonishing growth of Asian nations' space activities has increasingly captured the attention of the international space community. Whereas competition between East Asian nations in the field of space has already been addressed in several studies, the relevance and the potential of the ongoing cooperative efforts have been generally underestimated or dismissed as a mere soft power tool. This perspective examines efforts made in the direction of regional space integration in Asia. In practice, this objective is mainly being pursued through the Asia-Pacific Space Cooperation Organisation (APSCO) and the Asia-Pacific Regional Space Agency Forum (APRSAF). After outlining the specificities and dynamics of Asian regionalism, the reasons behind the establishment of the different regional space organisations are investigated. An overview of the respective policies, initiatives and current status of current programmes is provided subsequently. This in turn is used as a basis to outline the prospects for future cooperation in space activities among Asian nations. Finally, some considerations on the relevance of Asian space regionalism for future space governance and sustainability are presented.

1. Introduction

In recent years, the shift of the geopolitical and geo-economic barycentre to the Asia-Pacific region and the astonishing growth of Asian nations' space capabilities, particularly in military space activities, have led analysts to regard Asia as the world's new epicentre for a space race in the 21st century. China, Japan, India and North and South Korea are all expanding their space programmes and the competition among them may result in higher tensions, eventually leading to an arms race. This widespread belief stems from the fact that, since space activities are intrinsically linked to wider political dynamics, relations among Asian nations are problematic at best. The region is still haunted by the remnants of the Cold War: the Korean and Taiwan issue, the absence of a peace treaty between Japan and Russia, the numerous territorial disputes and the persistence of the U.S. "hub and spokes" system¹,

which for a long time has inhibited the development of multilateral relations.² In addition, beyond Pyongyang's brinkmanship strategy, the rise of China has raised many security-related concerns and initiated an economic and political leadership competition with Japan and India. Asia is, however, a region characterised by strong contradictions. On the one hand these enduring historical divisions and geopolitical rivalries still represent a potential threat. On the other hand the region has also witnessed an intensification of a regional integration process since 1989. The latter has been manifested by the establishment of numerous institutions, including the Asia-Pacific Economic Cooperation (APEC) process and the Association of Southeast Asian Nations (ASEAN) Plus Three - a permanent forum that functions as a coordinator of cooperation between ASEAN and

¹ In the sphere of East Asian relations, according to Victor Cha, hub-and-spokes refers to the network of bilateral alliances between United States and other individual East

Asian countries. V. Cha, "Powerplay: The Origins of the U.S Alliance System in East Asia", in *International Security* Vol. 34 n.3, MIT Press Journal 2010.

² For Asia this situation has resulted, unlike in Europe, in the lack of any tradition of regional arms control, cooperation on security-related issues and development of multilateral frameworks, like NATO.

China, Japan, and South Korea. Another initiative in this respect are the East Asia Summits (EAS) which aim at negotiating the conditions for the creation of an East Asia Community. The regionalisation process has followed different patterns compared to its European counterpart and for this reason its potential is often dismissed by Western analysts. Asian regionalism is characterised by its openness, loose structures and flexibility. These structural differences, however, do not automatically make it ineffective.³

These dynamics are very well mirrored in the space sector, where alongside competitive trends there are a number of cooperative efforts that are increasing in importance. The growth of China's space capabilities may have raised security concerns, but it has also acted as a powerful stimulus to enhance the level of cooperation. Despite the variety of cooperative efforts in the Asia-Pacific⁴, this Perspective will focus on the initiatives carried out by Japan and China. After all, they are the two most advanced Asian space-faring nations and the only ones currently able to structurally shape and lead regional space cooperation activities.

2. Two Regional Space Initiatives: APRSAF and APSCO

Cooperative undertakings in space activities in Asia date back to the early 1990s. At that time Japan, the leading actor in the economic development and integration process of the region, was willing to set up a framework to coordinate - under its leadership - Asian nations' space activities. To this end, at the Asia-Pacific International Space Year Conference in 1992, it proposed the creation of the Asia-Pacific Regional Space Agency Forum (APRSAF), which was established the following year. At its initiation, it was conceived as a talking shop intended to coordinate Asia-Pacific activities in space and enhance cooperation among the space agencies of various nations in the region. Since 1993 APRSAF has held annual meetings in rotating host locations co-organised by the Japanese Aerospace Exploration Agency (JAXA), the Japanese Ministry of Education Culture, Sports, Science and Technology (MEXT) and the agencies of the hosting countries. Japan's soft approach to regional cooperation has led to the

creation of an open and flexible regional cooperation mechanism aimed at responding to the diversity of needs in the region and at enabling different actors to participate in the forum. Currently, more than 300 institutions⁵ from 35 countries take part in APRSAF, making it the largest coordination structure for space activities in the Asia-Pacific region. Through this forum, participants aim at contributing to the region's socio-economic development, exchanging information on national space programmes and space resources, and discussing possibilities for future cooperation. APRSAF activities are carried out in a voluntary and cooperative manner by its parties, and are organised through four different working groups: Earth Observation, Communication Satellite Applications, Space Education and Awareness, and Space Environment Utilisation. The working groups are designed to share information about the activities and the future plans of each country and region in the respective areas. However, no coordination of strategy or policy among its members has been pursued and for a long time APRSAF has remained little more than a technology-oriented forum.

Recently, the centrality of APRSAF has been challenged by the much more institutionally entrenched framework of the China-led Asia-Pacific Space Cooperation Organisation (APSCO), which was established in 2005 and has been operational since 2008. Although APSCO is a relatively new organisation, its establishment is the final institutionalisation of an existing multilateral cooperative effort initiated by China more than 20 years ago: the Asia-Pacific Workshop on Multilateral Cooperation in Space Technology and Applications (AP-MCSTA). This workshop was conceived in 1992 to pursue regional scientific and technological exchanges between China and other developing states. Gradually, this cooperation was reinforced and eventually formalised with the Convention establishing APSCO. The official signing ceremony took place in October 2005 and the Convention entered into force on 12 October 2006, making APSCO the second largest space international organisation, after ESA. Currently nine countries are signatories of the APSCO Convention: Bangladesh, China, Indonesia, Iran, Malaysia, Mongolia, Pakistan, Peru, Tajikistan, Thailand, and Turkey, while Kazakhstan, Malaysia and Tajikistan are expected to accede to the Convention soon. Moreover, other countries have

³ See: T.J. Pempel, *Remapping East Asia. The Construction of a Region*, Cornell University Press, New York, 2005; P. Katzenstein, T. Shiraishi, *Beyond Japan: the Dynamics of East Asia Regionalism*, Cornell University Press, Ithaca, 2006.

⁴ Beyond APSCO and APRSAF, other relevant organisations are the Centre for Space Science and Technology Education in Asian and the Pacific, headquartered in India, and the ASEAN Subcommittee on Space technology and Applications.

⁵ Including not only space agencies and governmental bodies, but also international organisations, as well as companies, universities and research institutes.

been participating as observers.⁶ As for APRSAF, the composition of the organisation reflects the openness of Asian regionalism. Compared to APRSAF, APSCO presents a more formal structure, modelled on the ESA, with a permanent council and a secretariat headquartered in Beijing. It also enjoys full international legal status.⁷ The main purpose of this intergovernmental organisation, set out in Article 4 of its Convention, is “to promote and strengthen the development of collaborative space programmes between Member States, to assist Member States, to promote cooperation, joint development, and to share achievements among the Member States”. An analysis of the Convention reveals many similarities with the ESA Convention.⁸ In spite of these similarities, APSCO is still far away from being the equivalent of its European regional counterpart, mainly because of the role China plays in it. There is an asymmetry in space capabilities between China and the other APSCO members. In a sense, China acts like a *primus inter pares*, providing the direction and decision making process of the organisation, while it also sustains the major part of the financial cost.⁹ The fields of cooperation identified by article 6 of the Convention are space technology and applications, earth observation, space science research, education and training, space law, policy and regulations. Together with a Development Plan, concrete projects have been approved by the Council meetings in each of these fields:

- The Data Sharing Service Platform (DSSP), identified by the first Council as a priority project, responds to the double objective of building a platform for remote sensing data sharing and EO-related application development (mostly for early warning, disaster monitoring and resources exploitation). The platform, conceived to construct a bridge for enhancing the level of spatial information, application techniques and data sharing, was eventually established last May, while four application pilot projects to be led by Bangladesh, China, Pakistan and Thailand have been approved so far.

⁶ See: Taleb Zadeh A., “Space Law and Policy in the Asia-Pacific region: APSCO” Presentation. Resource document.

⁷ See art. 3 of APSCO Convention. The Secretariat of APSCO currently consists of four Departments, namely the Department of External Relations and Legal Affairs, the Department of Strategic Planning and Program Management, the Department of Education and Training and Database Management, and the Department of Administration and Finance.

⁸ For a deeper analysis of APSCO Convention see: D.K.W. Chen, S. Wan, “Space Powers on the Rise: The Legal and Political Implications of the Asia-Pacific Space Cooperation Organization”, ISU 13th Annual Symposium – “Space for a Safe and Secure World”

⁹ In order to avoid a hegemonisation of the organisation by a certain State, Article 18 of APSCO Convention states that financial contributions shall not exceed 18% of the approved budget of the Organisation. This provision, however, does not prevent China from leading the organisation in terms of decision making.

- In the field of earth observation, the Applied High Resolution Satellite Project (APRS), aims at having a constellation of two optical remote sensing satellites with a staggered approach. While the first satellite system must be procured through international bidding, the second one will be implemented directly by APSCO as maturity of technology and enough financial support is obtained.
- Other projects on designing, building and launching of light and middle class satellites for research activities and telecommunications – the Geostationary Telecommunication Satellite Project (ACSAT) - have been also approved by the Council.
- Another interesting initiative is the Asia Pacific Optical Satellite Observation System (APOSOS), which is designed to develop a unified space observation network based on optical trackers in APSCO Member States, able to track objects and space debris in Low Earth Orbit (LEO).¹⁰ The Council meetings have also approved projects dealing with satellite navigation and space science research.¹¹

In addition, training and education activities¹² are carried out on a regular basis, contributing to the exchange of information and the sharing of knowledge. Concerning space law activities, APSCO is currently promoting the establishment of a Research Centre for Space Policy and Space Law intended to benefit Member States and to promote regional peaceful uses of outer space. In parallel to these ongoing projects, the progressive solidification of the institutional structure of APSCO, and the fact that further activities are planned in the near future demonstrate that APSCO has the potential to become an influential player in space activities.

Since the establishment of APSCO, Japan has lost a lot of its influence in guiding cooperative efforts in space in East Asia. It soon became clear that the attractiveness of APSCO - especially for developing countries - could marginalise the actions of APRSAF. For Japan, given that the country wanted to remain forerunner in the wider regionalisation process, a diplomatic offensive was needed. As a response to the competition aspect introduced by China’s emerging ambitions, the Japanese Space Agency JAXA and the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) initiated more ambitious programmes, gradually transforming APRSAF from a talking shop into a programme

¹⁰ A future possible objective of this initiative is to bring new facilities, and extends the ability to track objects and space debris in Medium Earth Orbit (MEO) and Geostationary Earth Orbit (GEO), for a collision avoidance early warning service in the future.

¹¹ More precisely, research on Atmospheric Effects on Ka Band Rain Attenuation Modelling and Research on Ionospheric modelling through Study of Wave propagation.

¹² Including thematic and project training, Master Programs, Symposiums and a Doctoral Program, which will be initiated this year.

management structure.¹³ At the 15th APRSAF meeting in 2005, the Sentinel Asia programme was launched. Inspired by the European GMES programme, it aims at providing remote sensing data and imagery for environment and disaster monitoring and management. This was followed in 2008 by the 'Space Applications for the Environment' programme (SAFE) which focuses on the development of space applications for analysing climate change through the monitoring of water resources, sea levels, forest degradation and agricultural data.¹⁴ In 2009, the 'Satellite Technology for the Asia-Pacific Region' programme (STAR) programme broadened the scope of APRSAF activities beyond Earth observation. The STAR initiative, actively supported by JAXA, focuses on small satellite development and technology transfer. Finally, two other programmes were launched at the APRSAF meeting in Singapore in 2011: the Regional Readiness Review for Climate Missions (Climate R³) and the 'Asian Beneficial Collaboration' through the utilisation of KIBO, the Japanese module in the ISS (KIBO-ABC). While the latter aims at promoting the utilisation of KIBO by Asian Space Agencies, Climate R³ aims at making APRSAF a recognised space data coordination forum in support of common climate-related regional activities.¹⁵

3. Delivered Benefits of Competitive Cooperation

The dynamic resulting from the Japanese-Chinese interplay reveals some underlying differences in strategy. Admittedly, both China and Japan use the organisations as a vehicle for exercising their leadership. However, China aspires to be a leader by supremacy, whereas Japan aims at being a leader by example on a "peer to peer" basis. In this respect, Japan fosters the creation of public goods for region-wide socio-economic development.¹⁶ The co-existence of the two

¹³ K. Suzuki, "The Leadership Competition between Japan and China in the East Asian Context", in *International Cooperation for the Development of Space*, Morris&Cox, 2012.

¹⁴ *Ibid* p. 249.

¹⁵ Key elements of the Climate R³ initiative include: assessment of regional benefits of climate-related satellite missions; raising awareness of these benefits; emphasising applications of space-derived information; identification of future measures to enhance regional capacity and leverage global investment; and the development of appropriate related recommendations. *Cit.*: <http://aprsaf.org/initiatives/climate/>

¹⁶ The Japanese strategy is well expressed in the speech the former Minister of Foreign Affairs Taro Aso released on the occasion of the first East Asia Summit in 2005, where he presented Japan as the "thought leader" for Asia to be emulated, given its role as forerunner in the political and economic and the fact that it treats - unlike China - other nations as peers and equals. See T. Aso, *Asian Strategy as I See It: Japan as the 'Thought Leader' of Asia*, <http://www.mofa.go.jp/announce/fm/aso/speech0512.html>

different regional space organisations can be seen as a product of the competition between China and Japan and is one of the causes of the considerable fragmentation in Asian space cooperation. Although leadership competition increases the risk of a space race, it also produces positive outcomes.

First of all, the overall level of cooperation has increased significantly. Competition has not inhibited the current level of regional cooperation. On the contrary, it has acted as an unintended stimulus for enhanced cooperation. The will of China and Japan to assert themselves as the leading space power in East-Asia and as leader of the regional integration process has raised the level of ambitions of APRSAF and APSCO. Without the establishment of APSCO, the Japan-originated APRSAF would have probably remained a talking shop. At the same time, APSCO initiatives have become more ambitious as well, complementing technology transfers with infrastructure building. Thailand for instance, as a "target country" for both organisations, has been chosen to host the ground segment for receiving and processing the data of the APSCO Small Multi Mission Satellite (SMMS) project.

Leadership competition between China and Japan has proved to be beneficial for the other Asian countries in developing their space capabilities. In order to satisfy their needs, and to attract them to their respective organisations, China and Japan have increasingly provided technology transfers, space-based services, applications and scientific data. From the beginning APSCO, the first intergovernmental organisation almost exclusively composed of developing countries, has helped its members to improve their technical capabilities and to develop their space infrastructure. China's policy, as explained above, has in turn pushed APRSAF to move in this direction. Overall, the results are tangible and positive. Many countries in the region have seen their policy options increase and have been increasingly provided with efficient and economical access to space applications, Earth observation data and telecommunication capabilities. Eventually they have been accompanied in the process of reaching the capability level of the international space community.

4. Prospects for Cooperation

Apart from U.S. policy, which still proves to be a fundamental variable in the development of any regional initiative¹⁷, the possibility of more

¹⁷ For more information, please consult: Y. Fukushima, "An Asian Perspective on the new US space policy: The emphasis

integrated cooperation in Asia largely depends on the future interaction between Japan and China and the regimes they establish. Given the geopolitical rivalries and a climate of constant distrust between the two Asian giants, evolution towards a single regional mechanism seems highly unlikely, at least in the short term. This has also been underlined in the literature; J.C. Moltz stated in the *Journal of Contemporary China* that: “*The APSCO-APRSF rivalry, and their split largely along the lines of political orientation, bodes poorly for new forms of region-wide integration in space activities. There is no evidence yet of close engagement and cooperation among leading Asian states that might allow true burden-sharing and the reduction of competitive space impulses through mutual interdependence, as seen in Europe*”.¹⁸ One of the factors that impede the integration of APSCO and APRSAF is military in nature and relates to the Missile Technology Control Regime (MTCR). This association gathers countries that share the goals of non-proliferation of weapons of mass destruction. Members of this association have chosen voluntarily to introduce export licensing measures on, among other things, rocket technology. Troublesome are the facts that China is not a party to the MTCR and that APRSAF members with a western orientation, such as Japan, South Korea and Australia, are reluctant in their policies towards APSCO, given that countries such as Iran are also members of the organisation. For this reason the MTCR association, in spite of its purposes, has been described as “frustrating cooperation in space activities, particularly in the Northeast Asia”.¹⁹

The impediments, however, do not necessarily preclude the possibility of further cooperation between China and Japan. Several facts are relevant in this respect. First, the two countries have already proven that they are able to reconcile apparently irreconcilable attitudes. Both Beijing and Tokyo have been able to separate the political sphere of their relations from the economic one. Constant political frictions have not precluded mutually beneficial economic cooperation and interdependence. The expression *seirei-keinetsu* (‘cold politics - hot economics’) coined by the former Chinese Prime Minister Wen Jabao in 2004, summarises the essence of this

peculiar attitude, which at least for China and Japan, is not perceived as contradictory.²⁰ In addition, there are also incentives for cooperation and potential benefits may drive them to strengthen cooperation. Japan and China have already collaborated on specific issues. For instance, they have mutually exchanged data directly from earth observation satellites and Japan has conducted cooperative research using observation data together with China, Thailand, Australia, Indonesia, Malaysia, and Korea.²¹ Thus the *ad-hoc* operational basis of APSCO and APRSAF - usually underlined as a weak point - may prove to be a stimulating model for cooperation between the two leading space powers of the region. Finally, there are various common grounds that could ensure a certain degree of synergy between the two regimes. APSCO and many Chinese institutions already belong to APRSAF and Japan, while not being a signatory to the APSCO Convention, has sent representatives to APSCO sessions. In addition, many other APSCO Members are participants to APRSAF and there is an increasing overlap in the objectives, interests and activities of the two frameworks. These overlaps in cooperation interests and membership offer possibilities for interaction between the two regimes and ultimately could be an incentive for space cooperation. Initiatives of common interest could be a logical step, as they would reduce costs and avoid duplications and waste of financial and human resources. Possible candidate projects could be remote-sensing for disaster management, space research and education and, space debris mitigation. Moreover, there are numerous fields where wider functional cooperation or at least efficient coordination could be undertaken to pursue synergy.

To sum up, a regionalisation process for space activities is taking place in the Asia-Pacific.

on international cooperation and its relevance to Asia”, *Space Policy* 27, Issue 1, 2011.

¹⁸ J.C. Moltz “China, the United States, and Prospects for Asian Space Cooperation”, in *Journal of Contemporary China*, Volume 20, Issue 68, 2011, pp. 69-87.

¹⁹ S-M. Rhee, “Regional Cooperation in Asia relating to Space Activities – Northeast Asia Issue”, in *Asian Cooperation in Space Activities: A Common Approach to Legal Matters*, Proceedings of the 4th IISL regional Space Law Conference, Bangkok 2006.

²⁰ Sinologists have often underlined that in the *Sinic world* (a term referring to the countries strongly influenced by Chinese culture, namely Japan, Korea, Taiwan, Singapore, Vietnam) dilemmas are not necessarily perceived as trade-offs between two options with no margin of choice. In order to maximise their gains, these countries rather tend to apply what anthropologist Ruth Benedict has defined as a “but also” logic, where apparent non-compatible options can be carried out simultaneously. In other words, political impediments do not themselves constitute a reason for preventing engaging in cooperation. There are several examples both in terrestrial and space domains showing how seemingly conflicting strategies can co-exist. In this regard, it is interesting to analyse for instance the 2007 Chinese ASAT experiment and the parallel diplomatic initiative supporting the Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force Against Outer Space Objects (PPWT).

²¹ Cooperation on remote sensing activities is also promoted through the Asian Association of Remote Sensing (AARS) and through its annually-held conference. See: <http://www.a-a-r-s.org/acrs/>

Although the idea of an Asia-Pacific Space Agency (APSA) through a merger of APSCO and APRSAF has been already advanced²², this process does not yet appear to be moving towards convergence into a single framework of cooperation similar to the ESA model.²³ Rather, it appears to be taking the form of what has been defined as a ‘*space regime complex*’; an array of partially overlapping and non hierarchical regimes.²⁴ This structure comprises many other regional initiatives, such as the Indian-led Centre for Space Science and Technology Education in Asia and the Pacific, the ASEAN Subcommittee on Space Technology and Applications, the Asian Association on Remote Sensing, as well as national policies and bilateral cooperation agreements. Interestingly, this space regime complex follows patterns similar to wider economic integration in Asia, characterised by a wide spectrum of overlapping institutions and a flexible approach. The “soft regionalisation” produced by this space regime complex is nonetheless bound to have a constructive impact on regional space governance and the sustainability of space activities. As demonstrated in literature on international relations, regimes – defined as a set of principles, norms, rules and decision-making procedures around which actor’s expectations converge on a given issue – positively affect the behaviour of actors after their formation.²⁵ In fact, the regional cooperation set up and defined by these regimes not only induces compliance with international space law, but will also “create a practice that will further refine and strengthen the existing legal regime”.²⁶ By promoting dialogue and mutual understanding, mechanisms of political transparency and

confidence-building are created and competitive impulses mitigated. Asian nations, while building up their space infrastructure through a cooperative framework, can in this way become aware of the common challenges in the international space community and become more responsible in carrying out space activities. Eventually, this self-enforcing trend could gradually channel Asian space relations towards new, more mature and integrated forms of cooperation.

5. Conclusions

The rapid advancement of Asian space capabilities has not only been accompanied by rapid growth in leadership competition among the space leading powers Japan, China and India, but equally by reinforcement of regional cooperation. While the leading regional powers are rapidly developing security-related space assets, they have also embarked on cooperative undertakings with other developing countries in the region. This cooperation has already produced tangible results in terms of economic gains, know-how exchange and improvement of capabilities. There are several initiatives, such as the KIBO-ABC and the APOSOS project, that cannot be merely dismissed as power projection by China or Japan. They also respond to the need for cooperation and the will to create public goods with region-wide benefits, producing a win-win outcome. Despite the fact that cooperative undertakings still remain fragmented and divided on lines of political orientation, their institutional interplay appears to be coming closer. Even though this might not lead to the integration of APSCO and APRSAF, it will at least result in more efficient coordination among Asian nations’ space activities. In addition, the institutionalisation and activities of these regional cooperative mechanisms are raising awareness of the socio-economic, scientific and also security-related benefits cooperation can bring. Potentially, it might also transform the dominant trends of competition into a more cooperative win-win approach. The long-term result of the recently initiated regionalisation process is far from being clear, but it should be followed closely given its positive impacts on the risk of an Asian space-arms race scenario.

²² M. Suzuki, “Toward the establishment of Asia and the Pacific Space Agency”, in *Journal of Policy Studies* No.34, March 2010.

²³ Especially concerning integration of space programs, market access, international labour division and supply chain, cooperation will not result in integration comparable to the EU model. However, it is worth noting that even in the European market national perspectives still considerably affect policy making, industrial strategies and market access. This in turn is cause of duplications and a lower level of integration compared with other sectors. In addition, despite multinational in operation, European firms have realised a limited intra-firm rationalisation.

²⁴ X.L.W. Liao, “Consolidate the global space governance with regional cooperation mechanisms as building blocks” Presentation. Beijing Space Sustainability Conference, November 2012.

²⁵ The literature on iterated prisoner’s dilemma shows that when the transparency level of the States action increase and fears of defection are consequently reduced, incentives to cooperate inevitably increase. See: R. Axelrod, R.O. Keohane, “Achieving Cooperation Under Anarchy: Strategies and Institutions”. In *Neorealism and neoliberalism: the contemporary debate*, edited by D. A. Baldwin, New York, Columbia University Press, 1993.

²⁶ D.K.W. Chen, S. Wan, *Space Cooperation in the Asia-Pacific: The Story (or Stories) of APSCO and APRSAF*, IAC-09.E8.1.7



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Available for download from the ESPI website

www.espi.or.at

Short title: ESPI Perspectives 66

Published in February 2013

Editor and publisher:

European Space Policy Institute, ESPI

Schwarzenbergplatz 6 • A-1030 Vienna • Austria

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