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The Passengers' Rights Ombudsman in Poland.
A New Type of Dispute Resolution Between Air Passengers and Airlines.

by Piotr Kasprzyk

The Passengers' Rights Ombudsman in Poland. A New Type of Dispute Resolution Between Air Passengers and Airlines

*by Piotr Kasprzyk**

Abstract

This article discusses a new type of dispute resolution between air passengers and airlines in Poland under the provisions of Regulation (EC) No. 261/2004 of the European Parliament and of the Council of 11 February 2004 establishing common rules on compensation and assistance to passengers in the event of denied boarding and of cancellation or long delay of flights, and repealing Regulation (EEC) No. 295/91.[1] *The paper also aims to present the details of the complaint procedure in Poland, and to analyze the novel solutions stipulated in Polish air law.*

1. Introduction

The complaint procedure is the first step that passengers whose flight was delayed may take to seek compensation. The procedure is carried out before the operating air carrier directly.

Initiating the proceedings before an air carrier requires filing a complaint first. There is no doubt that the complaint may be submitted in paper format or electronically or via a form provided on the air carrier's webpage. The complaint should include the following: the personal data of the passenger whose flight was disrupted, flight number, reservation number, date and time of departure, planned date and time of arrival at the destination port, actual date and time of arrival at the destination port, flight distance, a designation of the place of departure and arrival, and the signature of the person filing the complaint or a professional representative acting on their behalf. The complaint should moreover contain a boarding pass or luggage ticket that proves that the passenger went through check-in which is required for compensation claims. In accordance with article 205b para. 4 of the Polish Air Law Act, air carriers must respond to complaints within 30 days of their submission. Passengers who do not receive a response within this deadline or receive a negative response may then refer their case to the Polish Civil Aviation Authority or a common court.

Article 16 para. 1 of EC Regulation 261/2004 establishes the general principle which in essence states that each Member State is obligated to designate a body responsible for the enforcement of the Regulation. This body is responsible for taking the necessary measures to ensure that air carriers respect the rights of passengers. Paragraph 2 of the abovementioned article states that any passenger may file a complaint to any Body designated under paragraph 1, or to any other competent body designated by a Member State, about an alleged infringement of this Regulation. The complaint may concern an infringement that took place at any airport situated on the territory of a Member State, or involved any flight from a third country to an airport situated on the territory of a Member State.

This paper aims to present the details of complaint proceedings and to analyze the novel solutions stipulated in Polish air law in cases where the air carrier rejects the passenger's claim for compensation. Previously, it was the Commission for the Protection of Passenger Rights attached to the Polish Civil Aviation Authority which had the authority, following a decision by the President of the Civil Aviation Authority, to award passengers with flat-rate compensation provided for in Regulation 261/2004. Since 1 April 2019, a Passengers' Rights Ombudsman employed by the Civil Aviation Authority has been appointed.

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1 For more on the Regulation, see: M. Bobek, J. Prassl, *Air Passenger Rights. Ten Years On*, Bloomsbury, 2016

2. Commission for the Protection of Passenger Rights. Conflict of competence.

Pursuant to Regulation 261/2004, each Member State is obligated to designate a body responsible for implementing its provisions. In most of these countries, the institutions responsible for handling complaints and executing the provisions of the Regulation are civil aviation authorities. In Poland, the supervisory body that monitors the observance of the provisions of Regulation 261/2004 is the President of the Civil Aviation Authority and, since 1 April 2019, the Passengers' Rights Ombudsman who is also employed by this authority. Since 2005, the duties of the President have been carried out by an organizational unit of the Civil Aviation Authority called the Commission for the Protection of Passenger Rights.

The duties of the Commission for the Protection of Passenger Rights have included handling complaints filed by passengers and imposing sanctions on air carriers in cases where infringements to Regulation 261/2004 were found. The Commission has handled complaints regarding events that took place at the airports of other Member States but involved air carriers registered in Poland. The Commission has cooperated with the Polish Office for the Protection of Competition and Consumers, as well as the European Consumer Center, Municipal Consumer Ombudsmen and Consumer Federations.

Until now, passengers could lodge complaints to the President of the Polish Civil Aviation Authority (the Commission for the Protection of Passenger Rights) when dissatisfied with the settlement decided on by the air carrier in response to their complaint or if the air carrier failed to respond to the complaint within 30 days of its filing. This deadline resulted from, *inter alia*, the act of 23 September 2016 on the out-of-court resolution of consumer disputes.[2] This means that a complaint could be filed to the Civil Aviation Authority only after the complaint procedure with the air carrier has been exhausted.

In cases where a passenger filed a complaint, article 205b para. 1 of the Polish Air Law Act, in its wording before 1 April 2019, granted the President of the Civil Aviation Authority to decide whether the air carrier infringed the provisions of Regulation (EC) No. 261/2004. If infringement was found, the President's decision indicated the scope of the infringement and imposed a penalty on the carrier. In other words, if a passenger's request was granted by the President of the Civil Aviation Authority, the air carrier was obligated to pay compensation to the passenger and to pay the imposed penalty. The amount due as specified in the President's decision was collected in accordance with the provisions of the Polish Code of Civil Procedure.[3] In other words, the President's decision was the enforcement order that civil courts then declared enforceable in terms of the applicable obligation (excluding the imposed penalty payments).

Since the issue of passengers seeking compensation for delayed flights was not directly regulated by Regulation 261/2004, a conflict of competence emerged between the President of the Polish Civil Aviation Authority and common courts with regard to the implementation of the Regulation and the mechanism through which passengers could seek compensatory damages. What was unclear was whether the President of the Civil Aviation Authority was the only body competent to decide on Regulation-related complaints, and what the relationship was between the administrative legal and judicial procedures. Two contradicting approaches have been presented in case law. According to the first one, the judicial process is unequivocally excluded since the matter is referred to the President of the Civil Aviation Authority as another body as per article 2 para. 3 of the Polish Code of Civil Procedure.[4] The contrary approach rules out the competencies of the President of the Civil Aviation Authority to decide on compensation based on article 7 of Regulation 261/2004 and opens the way for the judicial process before civil courts.[5]

2 Article 7a of the act of 23 September 2016 on the out-of-court resolution of consumer disputes (Journal of Laws of the Republic of Poland of 2016, item 1823).

3 Article 205b para. 6 of the Polish Air Law Act in its wording before 1 April 2019.

4 Judgment of the Regional Court in Warsaw of 26 March 2013, II C 562/13, unpublished; Judgment of the District Court in Warsaw of 19 September 2013, V CZ 3117/13, unpublished. See also Judgments of the Voivodeship Administrative Court in Warsaw: of 3 October 2007, VI SA/Wa 891/07, LEX no. 395313; of 9 July 2013, VII SA/Wa 535/13, LEX no. 1352719.

5 Judgment of the Regional Court in Warsaw of 25 May 2013, II C 620/13, unpublished; Judgment of the Regional Court in Poznan of 10 September 2013, V CZ 373/13, unpublished.

In its ruling of 7 February 2014, the Polish Supreme Court stated that "in a case where a passenger claims compensation for a delayed flight from an air carrier based on article 7 of Regulation (EC) No. 261/2004 (…) there is alternation in proceeding before common courts or before the President of the Civil Aviation Authority". [6]

The Supreme Court highlighted the coexistence of two paths of passenger rights protection which was beneficial for both the passengers who could take advantage of the free procedure via the Civil Aviation Authority and for compensation companies (whose numbers are increasing by the day) who receive additional income in the form of court costs (for each individual passenger) should they choose the judicial procedure. [7]

3. The Passengers' Rights Ombudsman. De lege lata considerations

Since 1 April 2019, the Passengers' Rights Ombudsman employed by the Polish Civil Aviation Authority has been appointed. The Ombudsman's term is 5 years but may be reduced by way of revoking the authorization granted by the President of the Civil Aviation Authority in cases of gross violation of the law while performing the assigned duties, illness that permanently prohibits the performance of these duties, the discovery of the failure to meet the requirements laid out in article 205a para. 3, or due to resignation. The Ombudsman is selected from among the employees of the Civil Aviation Authority. In accordance with article 205a para. 3 of the Polish Air Law Act, the Passengers' Rights Ombudsman shall be an individual who: holds a university degree, has knowledge in the field of air passengers' rights, has at least one year of professional experience associated with consumer or passenger rights protection and is a member of the civil service corps.

The Ombudsman handles out-of-court conflict resolution proceedings between air carriers and passengers with regard to financial claims resulting, *inter alia*, from Resolution (EC) No. 261/2004. These proceedings concern flights performed from airports located on the territory of the Republic of Poland and flights from third countries to these airports which are operated by an EU carrier.

The procedure before the Ombudsman is initiated as soon as they receive a complaint filed by a passenger (after the complaint procedure with the air carrier has been exhausted). The complaint is filed in paper format at the address of the Civil Aviation Authority or electronically: via ePUAP, an electronic platform for public administration services or via a dedicated contact form for passengers' complaints on the Biuletyn Informacji Publicznej webpage of the Civil Aviation Authority. As for the elements that make up the complaint, the way in which it is filed and the language that it is prepared in, the requirements are the same as in the case of the previous legislation (complaints filed with the Commission for the Protection of Passenger Rights).

In accordance with article 205a para. 16 of the Polish Air Law Act, an air carrier that infringed the provisions of the Regulation must agree to such proceedings before the Ombudsman.

The primary task of the Passengers' Rights Ombudsman is to reconcile the positions of the parties, consequently leading to an amicable settlement of the dispute within no more than 90 calendar days of receiving a complete complaint from the passenger, without the need for a judicial process. This deadline may be extended at the request of the parties (article 205a para. 14 of the Air Law Act). The Ombudsman takes on the role of a quasi-mediator.

A passenger's complaint is set aside with no further action if a year has passed since the day that the flight which is the basis for the complaint was performed or was to be performed. Meanwhile, the Passengers' Rights Ombudsman terminates the procedure in the following cases: if the air carrier does not agree to participate in the proceedings or does not respond within 21 days of receiving a letter from the Ombudsman informing them of the initiation of proceedings, or if the dispute is not resolved in 90 days.

6 Resolution of the Supreme Court of Poland of 7 February 2014, III CZP 113/13, OSNC 2014, no. 11, item 114.
7 Konert in: M. Żylicz (ed.), Prawo lotnicze. Komentarz, Wolters Kluwer, 2016.

The Ombudsman refuses to carry out proceedings if a passenger's complaint is filed to the Ombudsman in the same case again or if a case involving the same claim is pending or has already been considered by an authorized body specified in the act of 23 September 2016 on the out-of-court resolution of consumer disputes, another competent body or court, or if the passenger's complaint is aimed at causing a nuisance to the air carrier.

Due to staff shortages, the Passengers' Rights Ombudsman did not begin to operate until 1 November 2019, and in a 3-person team – until 1 February 2020. The team was expanded after 31 January 2021 and, as a result, in 2021 Alternative Dispute Resolution (ADR) requests were handled by 6 mediators, including the Ombudsman. The waiting time for a request to be examined was 22 months at the end of 2021. The requests were examined in the order of their filing. In 2021, the Ombudsman received 1410 requests for initiating amicable proceedings and yet due to the large number of cases, requests filed in 2020 were still being examined. A total of 3673 requests were examined in 2021. ADR proceedings were carried out in 1229 cases. The Ombudsman helped to reach an amicable resolution of disputes with 851 passengers which amounted to 254,223.18 EUR + 13,240.63 PLN and 95,368 ISK. [8]

The Ombudsman observed some recurring problems, the elimination of which could help accelerate proceedings. First, the Ombudsman pointed to the fact that the requests filed are often inappropriate in terms of the location and subject matter and advised applicants to research the competencies of the Ombudsman and the provisions of Regulation 261/2004 prior to filing their request. Second, the Ombudsman indicated applicants' failure to inform that their request is devoid of purpose when the dispute has been resolved by other means prior to the initiation of ADR proceedings, which results in the initiation of proceedings in the course of which the Ombudsman is being informed that the dispute has already been resolved. Applicants are therefore advised to send an email informing that the action has become devoid of purpose and that they are withdrawing their request. Third, applicants file incomplete requests: in about 90% of cases, information and documents missing in the request must be submitted for the ADR proceedings to be carried out, which delays the examination of requests. It is therefore advisable to review the request form and the information provided on the webpage. Fourth, applicants are not familiar with the ADR procedure and its regulations, causing them to fail to understand why their dispute is not resolved based on the evidence. Finally, there is also the issue of filing claims for compensation based on Regulation 261/2004 in disputes between the passenger and the ticket seller when in fact the Ombudsman is not competent to handle claims based on Regulation 261/2004 regarding intermediaries who sell airline tickets. [9]

Apart from the need for passengers (or their representatives) to review and apply the recommendations of the Passengers' Rights Ombudsman, it seems that a more effective approach towards the dispute resolution procedure involving organizational and financial changes is also necessary.

8 Report by the Passengers' Rights Ombudsman employed by the President of the Polish Civil Aviation Authority concerning out-of-court handling of passenger complaints in 2021 (https://www.pasazerlotniczy.gov.pl/aktualnosci/sprawozdanie-z-dzialalnosci-rzecznika-praw-pasazerow-za-2021-rok, accessed 14 October 2022)

9 Ibidem.

4. Conclusions

Until 1 April 2019, passengers in Poland had the rare opportunity to assert their rights that resulted from Regulation 261/2004 in two ways: via administrative proceedings before the Commission for the Protection of Passenger Rights and via court proceedings before common courts.

Decisions by the President of the Civil Aviation Authority were the enforcement order that civil courts then declared enforceable in terms of the obligation stated therein. This enforceability meant that a bailiff could collect the amount owed by the air carrier. The proceedings before the Commission for the Protection of Passenger Rights in fact amounted to seeking civil law damages in administrative proceedings. This was the only example of such a solution for consumers in Polish law, and probably also among EU Member States, in relation to Regulation 261/2004.

The role of the President of the Polish Civil Aviation Authority consisted solely in examining whether the air carrier infringed the provisions of Regulation 261/2004 and consequently imposing a penalty or stating a lack of infringement. There was no mention of reconciling the positions of the parties which is the primary task of the Passengers' Rights Ombudsman.

The introduction of the Passengers' Rights Ombudsman has undoubtedly shut down a free procedure for passengers seeking compensation for a delayed or cancelled flight, and for compensation companies who could have easy gains without any financial risk.

The introduction of amicable dispute resolution between passengers and air carriers is indisputably a positive development: it is effective and free, and both the entrepreneur and consumer take part in the proceedings of their own free will. Hopefully, the proceedings before the Ombudsman will be equally fast once organizational and financial issues are solved. Passengers who choose this path will avoid lawsuits which are definitely more complicated and at the same time require paying court costs.

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- Resolution of the Supreme Court in Poland of 7 February 2014, III CZP 113/13, OSNC 2014, no. 11, item 114.

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Space

An Analysis of the Long-term Sustainable Development Path of Outer Space – Win-Win Cooperation
by LU Yu

Powering the Innovation and Technological Creativity Flywheel with Nano-Satellites
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Rising Opportunities in the Satellite Connectivity Market: Eutelsat and OneWeb Combination
by Sara Dalledone

An Analysis of the Long-term Sustainable Development Path of Outer Space – Win-Win Cooperation

*by LU Yu**

Abstract

The long-term sustainable development of outer space is an important element of outer space security governance and a new development of international legal rules on outer space. The proliferation of giant satellite constellations in low orbit, the large amount of space debris and the occupation of orbital spectrum resources have an impact on the long-term sustainable development of outer space. The community with a shared future for mankind has been successfully practiced in the oceans, the polar regions and the Belt and Road construction process, and has also been written into the United Nations Committee on Peaceful Uses of Outer Space resolution in the field of outer space, which has a deep legal and practical foundation. As international governance systems for low-orbit giant satellite constellations, space debris and equitable distribution of orbital spectrum are being negotiated and designated, the concept of win-win cooperation for a community with a shared future for mankind is guiding the process of building international rules for the long-term sustainability of outer space. Win-win cooperation encourages diversified cooperation with international organizations, countries and private entities, and conducts multi-level and in-depth cooperation in the process of formulating low-orbit mega satellite constellation governance, space debris removal and remediation measures, and coordinating and allocating frequency-orbit resource rules, to achieve the win-win goal of the long-term sustainability of outer space.

1. Introduction

The long-term sustainability of outer space activities was proposed in response to new legal challenges posed by the continuous development of space science and technology. Low-orbit mega-constellations are monopolized by developed countries, occupying a large amount of high-quality orbital spectrum resources, increasing the risk of collision with other orbiting satellites, and affecting the rights of other countries to peacefully utilize and use outer space. The current dramatic growth of space debris in outer space has harmed the outer space environment, while also challenging the rules of international law. The regime for access to the orbital spectrum also does not ensure equitable access for all countries and the fairness of the right of access to orbit is questioned. The United Nations has repeatedly discussed agenda items for the long-term sustainability of outer space, but no solutions have been developed to date and further practical solutions need to be sought. On 28 January 2022, the Information Office of the State Council released a white paper entitled 'China's Spaceflight 2021', which is the first edition of the white paper after China started a new journey to build a modernized social state, and also comprehensively explains the purpose of China's space development and important tasks for the next five years. The white paper 'China's Spaceflight 2021' proposes for the first time to promote the building of a community with a shared future for mankind in the field of outer space and to build space power in an all-around way. It is proposed that space resources should be rationally developed and utilized, the space environment should be effectively protected, a peaceful and clean outer space should be maintained, the goals of the United Nations 2030 Agenda for Sustainable Development should be helped to emerge, a community of human destiny should be promoted in the field of outer space, and promotes the building of a community with a shared future for mankind in the field of outer space.[1] The implementation of a community with a shared future for mankind in the field

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1 State Council Information Office of the People's Republic of China, China's Aerospace in 2021, http://www.gov.cn/xinwen/2022-01/28/content_5670920.htm.

of outer space governance reflects the general aspirations of the international community, points out the direction for strengthening outer space environmental governance in the new era, and provides institutional guarantees for outer space governance. To ensure the long-term sustainable development of outer space, we need to improve the regulatory mechanisms and procedures for space debris mitigation and active removal, and low-orbit mega-satellite constellations as soon as possible from the perspective of win-win cooperation as a community with a shared future for mankind.

2. Element that threatens the long-term sustainable development of outer space

The long-term sustainable development of international environmental law promotes the proposal of the long-term sustainable development of outer space, and at the same time, the long-term sustainable development of outer space improves the connotation of long-term sustainable development of international environmental law. The long-term sustainability of outer space activities is proposed to deal with the new legal challenges brought about by the continuous development of space science and technology. Based on continuing the long-term sustainable development of international environmental law, the connotation has also undergone new developments. At present, the impact on the long-term sustainable development of outer space is divided into three aspects: such as the proliferation of low-orbit mega constellations, space debris, and the unfair allocation of orbital spectrum resources.

2.1. The number of low-orbit mega constellations has exploded

The low-orbit mega-constellation has also been called a near-earth mega-satellite constellation and a low-earth orbit satellite constellation, and its spatial location is extremely valuable. There are two reasons. First of all, the altitude of its satellites is only 3% of that of geostationary orbit satellites. Therefore, in low earth orbit, giant satellite constellations can use high-frequency bands, thereby greatly increasing the speed of communication broadband, and the satellite images that can be achieved, The time delay of communication is greatly shortened,[2] and secondly, the low-orbit mega-constellation has the advantages of low cost and more flexibility than high-orbit satellites. A large number of private companies are investing in low-orbit mega-constellations, resulting in a proliferation of satellites in near-Earth orbit and increasing congestion in near-Earth space, with companies such as Musk's SpaceX, OneWeb, and the European Union all building "mega-constellations" in low-Earth orbit(hereinafter referred to as LEO). SpaceX has applied to the Federal Communications Commission (hereinafter referred to as FCC) to launch 30,000 satellites into near-Earth orbit while building its Starlink giant constellation and has already launched 11,000 satellites in 2021. Between 2020 and 2021, the number of satellites in operation and decommissioned in LEO increased by 50% compared to the previous period.[3] China StarNet will integrate the "Hongyan" and "Hong Yun" low-orbit j giant constellation project, leading to undertake a large satellite communications project "GW" constellation plan. The International Telecommunication Union (ITU) public information shows that the "GW" constellation application was officially accepted on November 9, 2020, containing two sub-constellations GW-A59 and GW-2, with a total of 12,992 satellites.[4] These large constellations consist of large numbers of satellites that are highly susceptible to explosions or collisions, creating space debris.

Debris orbiting at high speeds not only pollutes the near-Earth space environment but also threatens the safety of satellites, spacecraft and aircraft. International law does not yet provide for and regulate LEO mega-satellite constellations, and the spectrum resources in LEO are limited and slowly becoming saturated. Unregulated LEO mega-satellite constellations affect the right of other nations to equitable access to space and will raise issues of environmental pollution

2 Tanishka, G., & Shikhar, A. (2021). OneWeb and the 'Mega' Effect of Mega-Constellations on International Space Law, Student Commentary, https://www.jurist.org/commentary/2021/05/goswami-aggarwal-international-space-law/.

3 Aaron, C., & Michael, B. (2021). Satellite mega-constellations create risks in Low Earth Orbit, the atmosphere and on Earth, Scientific Reports, 11, 1-8.

4 Oriental China Science and Technology, Mega Constellation - China Star Chain, http://www.jicheng.net.cn/news/1000708.html.

of outer space and outer space security. More importantly, given that LEO giant satellites can provide faster and more reliable internet services than their higher orbiting counterparts, and that communications satellites can provide the military with better situational awareness and tactical decision-making, LEO giant satellite constellations, if used for military purposes of intelligence acquisition, surveillance and reconnaissance, would be a challenge to outer space security and national security.

2.2. The crisis of space debris

Space debris also refers to space junk. As defined by the International Space Debris Committee, space debris refers to all man-made objects, including debris and parts of objects, that are not functional in Earth orbit or re-entering the atmosphere. [5] Since 2017, the European Space Agency (hereinafter referred to as ESA) has published an annual space environment report, which provides a transparent overview of global space activities and focuses on the impact of space flight activities on the space environment to improve the implementation of space debris mitigation measures.

In 2022 ESA released the space environment report showing that as of April 4, 2022, at present is still running at about 5400, the number of satellite network regular tracking and save the number of pieces of directory objects is about 31050, debris dissolution, explosion, the number of collisions more than 630, but not all of the pieces have been tracking and catalog. According to statistical models, about 36,500 pieces of orbiting space debris are more than 10 cm in diameter,1 million pieces are between 1 cm and 10 cm in diameter, and 130 million pieces are between 1 mm and 1 cm in diameter. [6] The growing debris will lead to a cascade of collisions, even if no spacecraft is launched into orbit, and collisions between existing space debris objects will lead to a further increase in the amount of debris, resulting in Kessler syndrome. From the perspective of environmental protection, high-speed space debris has caused serious pollution to the outer space environment, and space debris carrying nuclear fuel will also cause damage to the earth and its surrounding environment. For example, in 1978, the COSMOS 954 satellite of the Soviet Union, a small nuclear reactor loaded with 45 kg of highly enriched uranium fuel, crashed out of control into the Canadian area, producing a large amount of radioactive debris and material, which was the world's first uncontrolled re-entry of radioactive material into the Earth. In addition, space debris not only poses a collision threat to spacecraft and space stations in outer space but also causes damage to objects and personnel on the earth's surface, with great lethality.

2.3. Unfair orbit spectrum resource allocation system

Orbital spectrum resources are a limited natural resource and an important source of value for the satellite industry. The International Telecommunication Union (hereinafter referred to as ITU) is the specialized United Nations agency for information and communication technology, which allocates the global radio spectrum and satellite orbits and sets technical standards on networks and technology.[7] The system of allocation of track and spectrum resources thus dates back to article 33 of the International Telecommunication Convention and article 44 of the Constitution of the International Telecommunication Union, namely, that they must be used reasonably, efficiently and economically, following the provisions of the Radio Regulations, and that they should take into account the special needs of developing countries and the special needs of the geographical locations of certain countries. Make them fair to use these orbits.[8] Unfortunately,

5 Inter-Agency Space Debris Coordination Committee, IADC Space Debris Mitigation Guidelines, Revision 2, https://orbitaldebris.jsc.nasa.gov/library/iadc-space-debris-guidelines-revision-2.pdf.

6 European Space Agency. (2022). Space Debris Office, Space Environment Report. Retrieved from https://www.esa.int/Space_Safety/Space_Debris/ESA_s_Space_Environment_Report_2022.

7 Two different transmissions on the same frequency in the same geographical area will interfere with each other, resulting in signal degradation or even loss. This is where ITU comes in. By coordinating frequencies between adjacent satellite network operators, it aims to at ensuring that no satellite system interferes with another system by operating on the same radio frequency in the same orbital location.

8 International telecommunication union, convention of the international telecommunication union, https://www.itu.int/council/pd/convention html

based on an analysis of Articles 5, 9 and 11 of the Radio Regulations, as well as Appendices 30, 30A and 30B,[9] the Radio Regulations provide for two methods of use and allocation of spectrum and track resources: first, equitable access and use of spectrum and track resources by States. Second, countries through the declaration and coordination mean of legal 'first come, first served'. However, equitable use of spectrum and orbital resources applies only to two types of satellite services in specific bands, namely, broadcast satellite services and fixed satellite services.[10] Therefore, 'first come, first served' principle is the main principle followed by spectrum and track allocation. States thus enjoy priority in the use of the radio spectrum in designated orbits under the 'first come, first served' procedure.

The number of satellites launched into low Earth orbit by private companies in developed countries has been growing, given ITU's 'first come, first served 'allocation system. Many developing countries had not yet put satellites into orbit due to technical or economic constraints and the enjoyment of outer space benefits was affected by this allocation system. The current orbital spectrum use system does not ensure fair access for all countries, and the fairness of orbital access rights has been questioned. Therefore, the use of orbital spectrum resources based on the 'first come, first served' rule was unacceptable and violated the principles of peaceful use of outer space and non-appropriation of outer space as one's own. There was an urgent need to establish a legal mechanism guaranteeing equitable access to orbital positions by all States.

3. The legal theory of win-win cooperation in a community with a shared future for mankind

The traditional rules of international cooperation are based on the dominance of hegemonic countries and cannot guarantee the fair distribution of international interests. Hegemonic countries conduct international cooperation with weak and small countries to maximize their interests, enjoy the benefits brought by international cooperation, pursue the maximization of their interests, and ignore the demands and interests of countries that do not develop. Therefore, the traditional rules of international cooperation are unable to cope with global issues such as climate warming, artificial intelligence weapons and outer space environmental governance. In this context, in the 19th National Congress of the Communist Party of China (hereinafter referred to as CPC), Secretary-General Xi Jinping pointed out:

"China will hold high the banner of peace, development, cooperation and win-win, abide by the foreign policy purpose of maintaining world peace and promoting common development, and will be unswerving. Develop friendly cooperation with other countries based on the Five Principles of Peaceful Coexistence and promote the building of a new type of international relations featuring mutual respect, fairness and justice, and win-win cooperation".[11]

The Community of shared Future for Mankind proposes to build a new type of international relations featuring win-win cooperation. It breaks through the traditional rules of international cooperation and further expands and expands the connotations of international cooperation. The concept of win-win cooperation has a strong legal and practical basis. China proposes to address global challenges. It pays attention to the interests of the international community as a whole while focusing on its interests and responds to the international needs of developing countries.

9 International telecommunication union, Radio Regulations, https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-REG-RR-2020&media=electronic.

10 Although there are two rules of "first boarding, first occupying" and "*fair use*" in the satellite orbit resources and frequency allocation of the International Telecommunication Union, so far, "fair use" of the geostationary orbit can only be achieved through two allocation schemes: First, Broadcast Satellite Service (BSS) operates in the 12GHz band and connected feeder links; second, Fixed Satellite Service (FSS) operates in the 6/4GHz to 14/11GHz bands. "first register first occupy" principle applies to all communications satellite services.

11 Xi, J. (2017). The decisive victory in building a moderately prosperous society in an all-round way and winning the great victory of socialism with Chinese characteristics in the new era - a report at the 19th National Congress of the Communist Party of China. China: People's Publishing House.

3.1. Legal basis for the concept of win-win cooperation

The concept of win-win cooperation provides a solution to global problems that cannot be solved by the principle of international cooperation, such as climate change, artificial intelligence weapons, and outer space environmental governance. The legal basis of the principle of win-win cooperation is based on the principle of international cooperation in international law. On this basis, the connotation of international cooperation is further deepened. The application in outer space has a profound legal basis, which is derived from the general international law and legal rules of the United Nations Charter. Provisions of the Specialized International Law of Outer Space Treaties and Declarations. As a charter of international law, Article 1 of the Charter of the United Nations stipulates the objectives and purposes of international cooperation.[12] This article indicates the important status of international cooperation in international law, and has been mentioned many times as a guiding principle in various conventions and legal documents. In the international legal system of outer space activities, the five outer space treaties and other supplementary international documents on outer space activities, Article 1 of the Outer Space Treaty encourages countries to conduct international cooperation in outer space scientific research activities, and Article 9 of the guidelines for international cooperation should Taking into account the equal interests of other countries, and explained in Article 10,[13] that should not prevent other countries from equitably accessing outer space. In addition, Agreement Concerning the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space(hereinafter referred to as Rescue Agreement), Convention on International Liability for Damage Caused by Space Objects (hereinafter referred to as Liability Convention), Convention on Registration of Objects Launched into Outer Space(hereinafter referred to as Registration Convention) and Agreement Governing the Activities of States on the Moon and Other Celestial Bodies(hereinafter referred to as Moon Agreement) among the five treaties all stipulate different rules and procedures for international cooperation. In addition to the rules of international law with a legal effect that provides for international cooperation in outer space, the principles and declarations adopted by the UN COPUOS, although not legally binding, are international documents of a soft law nature, which also further improve and supplement the connotation and form of international cooperation. such as the 'Declaration of Legal Principles for the Activities of States in the Exploration and Use of Outer Space', 'Principles Relating to Remote Sensing of the Earth from Outer Space', 'Principles Relating to the Use of Nuclear Power Sources in Outer Space' in the preamble to propose international cooperation, Among them, the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries establishes eight guiding principles for international space cooperation, which can provide technical and financial support, as well as the support of legal norms for the work of long-term sustainability of outer space activities. among which The Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and Interest of All Nations, Taking Special Consideration into the Needs of Developing Countries Long-term sustainability of activities provides technical and financial support, as well as legal support.[14] The concept of win-win cooperation is also the pursuit of peaceful exploration and use of outer space for the benefit of all mankind, which is consistent with the Declaration on Legal Principles Concerning the Exploration and Use of Outer Space by States and The objectives of the Treaty on Principles for Space Activities are coherent and organically linked to each other.[15]

12 Article 1 of the Charter of the United Nations stipulates that: "*To achieve international co-operation in solving international problems of an economic, social, cultural, or humanitarian character, and in promoting and encouraging respect for human rights and fundamental freedoms for all without distinction as to race, sex, language, or religion*".

13 Article 9 of the Outer Space Treaty stipulates that: "*There shall be freedom of scientific investigation in outer space, including the moon and other celestial bodies, and States shall facilitate and encourage international co-operation in such investigation." Article 10 of Outer Space Treaty stipulates that: "To promote international co-operation in the exploration and use of outer space, including the moon and other celestial bodies, in conformity with the purposes of this Treaty, the States Parties to the Treaty shall consider on a basis of equality any requests by other States Parties to the Treaty to be allowed to observe the flight of space objects launched by those States*".

14 Yin, Y., & Yan, Y. (2017). Analysis of International Cooperation on Long-term Sustainability of Outer Space Activities. Journal of Beihang University (Social Science Edition), 2, 37-45.

15 Statement by head of the Chinese delegation, Strengthening the governance of and promoting cooperation and win-win in outer space, in a joint effort to build a shared future in space exploration and use, https://www.unoosa.org/documents/pdf/copuos/2018/hls/03_01E.pdf .

3.2. Practical basis of the concept of win-win cooperation

At the international level, China has on many occasions proposed a community with a shared future for mankind and proposed win-win cooperation to solve ocean, outer space and climate issues. At the domestic level, China has also actively implemented the concept of win-win cooperation, strengthened cooperation in the space field, and promoted the development of space capabilities of developing countries through win-win cooperation. For example, China has established cooperation mechanisms in the field of satellite navigation with a number of countries and regions related to 'the Belt and Road', jointly built 'the Belt and Road' spatial information corridor, and strengthened cooperation with relevant international satellite systems and provided space information services and shared space data and services for Belt and Road countries and regions. In terms of space technology, China helps developing countries and countries along 'the Belt and Road 'to carry out space technology applications and space science research, achieve information interconnection, and benefit the economic and social development of 'the Belt and Road' countries. In addition, China Beidou satellite system provides global users with all-weather and high-precision positioning and navigation services, shares satellite remote sensing data with other countries, opens China's space station, and provides strong support for projects such as the United Nations Disaster Management and Emergency Response Space-based Information Platform. The concept of win-win cooperation guides the successful construction of the Belt and Road and China's space station and promotes the development of developing countries, which has been generally recognized by the international community.

When carrying out international cooperation in outer space, China has carried out in-depth cooperation with developing countries, fully taking into account the interests of new space countries, such as China's space station cooperation model, on the one hand, attracting more developed space to participate. Because the concept of win-win cooperation does not require developed countries to sacrifice their interests to meet the space interests of developing countries but to achieve a balance of space interests between space powers and emerging space countries.[16] On the other hand, it also creates opportunities for the participation of developing countries to take into account the interests that developing countries can obtain by participating in international cooperation while enriching their national interests.[17]

4. The form of win-win cooperation in outer space - diversification

Win-win cooperation is of great value in addressing the long-term sustainable development of outer space, plays an important role in achieving the 2030 Sustainable Development Goals, and supports multi-level cooperation among countries, regions, and between countries and regions. Stronger international cooperation also requires the participation of experts from all walks of life. Therefore, choosing an international system of outer space governance dominated by public-private cooperation of 'government + commercial entities' will be more acceptable to the international community.[18] Therefore, in the process of building a rule system for the long-term sustainable development of outer space, under the guidance of the concept of win-win cooperation, cooperation with international institutions, countries and private commercial entities should be carried out to actively promote the realization of a community with a shared future in outer space.

16 Zhao, Y. (2015).Application of the Principles of International Cooperation in Outer Space Activities: Formal and Substantive Requirements, International Space, 1,36-39.
17 Jiang, S. (2020). Exploration and Analysis of International Cooperation in the Construction of China's Space Station from the Perspective of a Community of Shared Future for Mankind, Journal of Shanghai University of Political Science and Law, 5, 9-19.
18 Wang, G., Zhang, Y., & Yang, Y. (2020). Research on the Connotation and Development Trend of Space Traffic Management.International Space, 11, 33-39.

4.1. Make good use of international institutions

We will make full use of the platform of the United Nations Committee on Outer Space Affairs and enhance cooperation with other international organizations.[19] The outer space commission and the UN Office for the outer space affairs are to promote international cooperation, explore and utilize the space platform. COPUOS promotes outer space activities, develops international space law, and promotes dialogue between spaceflights and emerging space nations, responding to the needs of developing countries and enhancing space capacity building in developing countries.
In addition, COPUOS promotes dialogue and cooperation among the Member States and organizations with permanent observer status and strengthens partnerships among States, intergovernmental and non-governmental organizations, industry and private sector entities. It provides solutions for the governance of the outer space environment.[20] The resolutions and guidelines adopted by the UN COPUOS and other international agencies have promoted the formation of outer space environmental governance treaties and customary international law. The international rules of space debris have been widely practiced among countries for a long time, and constitute the material elements of customary international law.[21] For example, many countries are implementing the 'Space Debris Mitigation Guidelines' and 'Guidelines for Long-term Sustainability of Outer Space Activities' with COPUOS, the 'IADC Space Debris Mitigation Measures Guidelines' of the Inter-Agency Space Debris Coordination Committee, and the guidelines for Space Debris Mitigation Measures' of the International Organization for Standardization. Space debris mitigation measures are consistent with ISO Standard 'Space Systems - Space Debris Mitigation Requirements'. States review and update relevant domestic regulations, strengthen registration of space objects, develop a falling object detection system in outer space, develop a space situational awareness road map, and broaden government-private sector partnerships. States improve their ability to detect, track and identify operational space objects and develop best practices for avoiding spacecraft collisions. Although the guidelines for the Long-term Sustainable Development of Outer Space Activities adopted by the United Nations General Assembly is a document that lacks legal binding force and belongs to the soft law of outer space, it provides the basis for the formulation of legally binding treaties and the formation of customary international law.[22] It is also an important means to ensure the safe and sustainable use of outer space and can provide timely, effective and efficient solutions for outer space security governance.[23] Countries have incorporated internationally recognized norms and standards related to space debris into relevant provisions of their national laws, strengthened national mechanisms related to space debris mitigation measures, designated governmental oversight bodies, and developed new regulations, instruments, standards and frameworks, which Show that states must recognize and feel that they are complying with international legal obligations proves the existence of the subjective factor of opinion Juris in customary international law.[24] For example, 'the Interim Measures for the Management of Space Debris Mitigation and Protection' issued by the State Administration of Science. Technology and Industry for National Defense in 2010 were officially implemented, which marked that China's management of space debris mitigation and protection began to be included in the management of the rule of law, and also marked that my country, as a responsible aerospace power, has a strong commitment to the international community. made a solemn promise. Similarly, the Finnish Space Activities Act (hereinafter referred to as the Act) emphasized the importance of sustainable and environmental protection in outer space, discussed the development of space resources, considered that the current space activities included space resource development activities, and mentioned the issue of space debris.[25]

19 Cai, G., & Wang, R. (2021). On China's Plan for Space Debris Mitigation and Active Clearance in the New Era. Space Debris Research,3,39-45.
20 United Nations Office for Outer Space Affairs, Conference room paper by the Chair of the Working Group on the Long-term Sustainability of Outer Space (A/AC.105/2018/CRP.20) https://www. unoosa.org/oosa/oosadoc/data/documents/2018/aac.1052018crp/aac.1052018crp.20_0.html.
21 Wang, T. (1995). International Law.China: Law Press.p.11.
22 Gable, K. A. (2007). Rules Regarding Space Debris: Preventing a Tragedy of the Commons, Proceedings on the Law of Outer Space,50, 257-266.
23 United Nations Office for Outer Space Affairs. (2022). Long-term sustainability of outer space activities & V. Space debris (A/AC.105/C.1/L.394/Add.1). Retrieved from https://www. unoosa.org/oosa/en/oosadoc/data/documents/2022/aac.105c.1l/aac.105c.1l.394add.1_0.html.
24 Huang, Y. (2017). Space Debris Governance from the Perspective of International Soft Law, Journal of Dalian Maritime University (Social Science Edition), 16(4),34-43.
25 Ministry of Economic Affairs and Employment, Act on Space Activities (63/2018), https://spacefinland.fi/en/act-and-decree-on-space-activities.

4.2. Deepen cooperation among countries

Countries need to strengthen international cooperation through the Committee on the Peaceful Uses of Outer Space to achieve sustainable development goals in outer space, especially countries with strong space capabilities should actively contribute to win-win cooperation.[26] For example, on April 23, 2021, China and Russia issued the' Joint Statement of the China National Space Administration and Roscosmos on Cooperation in the Construction of an International Lunar Scientific Research Station. The International Lunar Scientific Research Station adheres to the principle of "extensive consultation, joint contribution and shared benefits" promotes the extensive cooperation of the International Lunar Scientific Research Station, is open to all interested countries and international partners, strengthens scientific research exchanges, and promotes the peaceful exploration and utilization of space by all mankind. The International Lunar Research Station not only contributes to the sustainable development of outer space but is also an international practice of a community with a shared future for mankind in outer space, further illustrating the win-win cooperation in the aerospace field. Space interests must benefit all nations, regardless of their level of scientific, technological, or economic development, and should not be limited to space powers. Win-win cooperation recognizes the importance of developing countries participation in discussions on outer space, encourages cooperation between space powers and developing countries, and responds to the application needs and capacity building of developing countries. Win-win cooperation Identify the areas of common interest of space powers to developing countries and carry out various forms of bilateral, multilateral, and regional international cooperation. Win-win cooperation enables developing countries to benefit from the research and development of space activities and promotes technology in developing countries. Win-win cooperation allows developing countries to benefit from research and development in space activities, promotes the exchange of technical information and expertise among developing countries, and provides them with access to infrastructure and space development tools. Such measures are highly attractive to developing countries. The concept of win-win cooperation is crucial to achieving the Sustainable Development Goals and consolidating the central role of the Committee on Outer Space.

4.3. Actively cooperate with private entities

Win-win cooperation requires cooperation between other subjects of international law and private entities. Many private entities launch low-orbit mega-constellations of hundreds of small satellites,[27] occupying a large number of low-Earth orbits, and the number of commercial satellites exceeds that of government agencies. Due to the small size of these satellites, there is no editorial cataloging and tracking of the smaller-sized satellites. So far, the primary source of information on space objects launched by commercial operators has been the U.S. military's Joint Space Operations Center, which uses radar and other sensors to track orbiting satellites and debris, but it has significant limitations. Firstly, the main mission of the Joint Space Operations Center is to serve the US government and it does not have the transparency that commercial operators need. Secondly, the Joint Space Operations Center's data is not the most accurate, and also does not track low-orbiting mega-constellation satellites.

Having an accurate and up-to-date list of space objects is essential for the international community when developing a space traffic governance system. Private entities master the orbital data of their launched satellites, so the sharing of orbital data can make the orbital data of satellites more accurate, effectively assess collision avoidance, and promote in-depth cooperation between private sector entities and industries. Suppliers and users come together to strengthen existing partnerships and strengthen international space cooperation to contribute to the achievement of the Sustain-

26 Pan, X. (2021). Research on Legal Issues of Active Removal of Space Debris: From the Perspective of Long-term Sustainability of Space Activities, Collection of Shanghai Legal Studies, 14,184-190.

27 Zhao, Q. (2021). Problems and Countermeasures of Space Debris Governance from the Perspective of LTS Guidelines, Collection of Shanghai Legal Studies, 14,166-172.

able Development Goals. By actively cooperating with private entities to further improve flight safety, the international community can jointly formulate a space data treaty with commercial satellite operators to share the position information and data of commercial satellites in orbit, which will help other operators to predict more accurately. The probability of collision can keep a safe distance between spacecraft and improve flight safety, thereby improving the problem of space debris. To encourage active participation by countries and commercial operators without compromising national security, countries need only share information about satellite locations, not details such as the purpose of their operations in space. Even with today's geopolitical tensions, nascent spaceflight nations will have a lot of incentive to engage.

5. Conclusion

The win-win cooperation proposed by the community with a shared future for mankind provides a guarantee for the long-term sustainable development of outer space. The concept of win-win cooperation is the international community's response to the problems of low-orbit giant satellite constellations, space debris, and spectrum orbit resources. It is also a new approach to traditional international cooperation. It is of great significance to the long-term sustainable development of outer space. As an important measure to promote the long-term sustainable development of outer space, the concept of win-win cooperation is also an inevitable trend of space technology development under the concept of a community with a shared future for mankind. In the context of seeking absolute space superiority in the United States, and the specific procedures and rules for space situational traffic governance, active removal of space debris, and spectrum orbit resources are still to be negotiated and determined, the legal system for the long-term sustainable development of outer space should be based on win-win cooperation. as the target. Countries should carry out multi-level cooperation in space situational traffic governance, active removal of space debris, and equitable allocation of spectrum and orbital resource systems. Using a win-win cooperation model to solve the long-term sustainable development of outer space has profound theoretical foundations and practical experience. The successful practice of win-win cooperation provides a solution to the long-term sustainable development of outer space. It is a very valuable solution proposed by China in outer space governance, which improves the space capacity building of developing countries, and enables developing countries to enjoy exploration and development.

Powering the Innovation and Technological Creativity Flywheel with Nano-Satellites

*by Luisa Santoro**

Abstract

Small satellites are profoundly changing both the space industry and market, thanks to their low cost and fast development, especially compared to traditional spacecraft, as over the years they have evolved to increasingly reliable satellites for (multiple) space applications and/or missions. Equipped with miniaturized and innovative technologies, such platforms represent an easy way to embark high-tech tools for in-orbit demonstration, also enabling new mission concepts as, for instance, missions combining small and traditional satellites in a wide spectrum of domains, from science to exploration. Italy has been dealing with small satellites since the beginning of its space journey, in 1964, when it launched San Marco 1 - the first in-house built mini-satellite. So, capitalizing on an enduring national legacy rooted in a long history of national and international successful missions, the Italian Space Agency has launched the Alcor program, which is specifically designed to support the development of micro- and nano-satellites by fostering an entrepreneurial domestic ecosystem of about 200 companies and 7,000 employees, with a flywheel effect extending even to space diplomacy, since small satellites can also facilitate international collaborations. Details about the first results of the Alcor program are provided in the final part of the article.

1. Introduction

The future of our planet is increasingly dependent on satellites: communications, data transmission, electricity distribution, GPS systems, sea/land/air security, navigation, localization systems, weather forecasts and many more daily activities would not be possible without them, with benefits that also have substantial economic implications, since, for example, they allow the forecast optimization of any of the aforementioned services. Not surprisingly, the satellite sector represents 73% of the New Space Economy[1], which at the moment is worth around 400 billion and is expected to soar to 4,000 by 2030. According to McKinsey, in a few years the current almost 5 thousand operational in-orbit satellites are forecasted to increase to 50 thousand by 2030, crowding the low Earth orbit as never before, along with the International Space Station, the Chinese Tiangong and any other future stations, including private ones.

Giant leaps in scientific and technological development have made it possible to reduce the size of most instruments, including satellites, so that "*their advantages in reduced cost and development time continue to attract investment*"[2] and attention.

1 https://www.spaceconomy360.it/industria-spaziale/space-economy-italia-quinto-paese-al-mondo-il-pnrr-leva-di-new-business/.
2 https://ntrs.nasa.gov/api/citations/20190031730/downloads/20190031730.pdf.

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NASA classifies[3] small satellites as follows[4]:

Spacecraft Class Definition		Wet Mass, kg
Large Spacecraft		≥1000
Small Spacecraft	Medium Spacecraft	500-1000
	Mini Spacecraft	100-500 *
	Micro Spacecraft	10-100
Cubesats	Nano Spacecraft	1-10
	Pico Spacecraft	0.01-1
	Femto Spacecraft	0.01-0.01**

* organization-dependent upper thresholds vary from 180 to 500 kg
** organization-dependent upper thresholds vary from 0.01 to 0.1kg

Soviet Union's Sputnik and US Explorer 1 were small satellites, as well as many more after them, but it was only in 1999 that - thanks to California Polytechnic State University (Cal Poly) Professor Jordi Puig-Suari and Stanford University Space Systems Development Laboratory professor Bob Twiggs - ad-hoc specifications for cubesats were developed, in order to promote their use for academia and education purposes, aiming at increasingly using them for the development of the skills necessary to design, manufacture, and test small satellites for low-Earth orbit (LEO) scientific research functions, the demonstration of spacecraft technologies for small satellites and also to experiment new technologies in Earth observation, amateur radio activities, as well as for biological research payloads, miniaturized scientific experiments, etc.

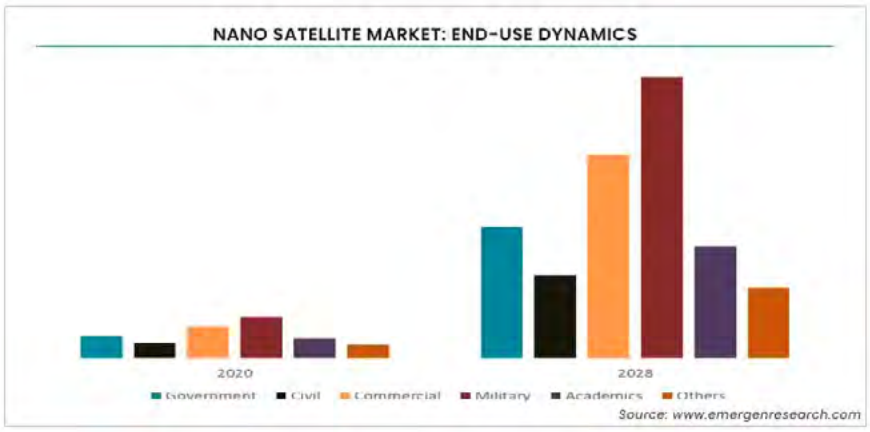
Since its first adoption, such class of spacecraft has played an important role in making it possible for SMEs, universities, research centers and emerging countries to launch their own satellite, so that generations of scientists and engineers have been able to receive unprecedented specific hands-on training. As a result, today small satellites are profoundly changing both the space industry and market, thanks to their low cost and fast development, especially compared to traditional satellites, because over the years they have evolved from simple educational tools to reliable satellites for (multiple) space applications and/or missions. Equipped with increasingly miniaturized and innovative technologies – at times even with components made of plastic -, cubesat platforms represent an easy way to embark technologies for in-orbit demonstration, also enabling new mission concepts as, for instance, missions combining small and traditional satellites in a wide spectrum of domains: from remote sensing and surveillance tracking to astrophysics, space weather, robotic exploration of the solar system, etc. In addition, launch opportunities for small satellites are much more frequent than for traditional ones, since they are often taken into orbit as secondary payloads of already-planned traditional missions, which also entails reducing cost.

Standard cubesats are made up of 10 cm × 10 cm × 11.35 cm units designed to provide 10 cm × 10 cm × 10 cm or 1 liter of useful volume, with a weight of no more than 2 kg per unit[5]; the smallest standard size is 1U, corresponding to a single unit, while the most common form factor is the 3U. The number of joined units determines the size class of cubesats, that are scalable only on one axis, so as to fit the forms of 0.5U, 1U, 1.5U, 2U, 3U, 6U, etc.

So far, small satellites have been flown in several programs and are planned to be used in missions to the Moon, while the first cubesats in deep space - a pair of 6U cubesats named "*Mars Cube One*" or MarCO - were flown within the NASA InSight mission in May 2018, in order to test their navigation and endurance in deep space along with "*the operational concept of relay via small spacecraft and their significant role in reducing mission risk as well as overall mission cost*"[6].

3 "Since Space is not recognised as a category in international standards of industrial classification, worldwide national space statistics differ in definition, coverage and methodology, generating a lack of international comparability" (https://space-economy.esa.int/article/34/measuring-the-space-economy).
4 https://ntrs.nasa.gov/api/citations/20190031730/downloads/20190031730.pdf.
5 CubeSat Design Specification Rev. 14 - The CubeSat Program, Cal Poly SLO.
6 https://arc.aiaa.org/doi/pdf/10.2514/6.2016-2483.

The global nano- and micro-satellite market is estimated to grow from USD 2.3 billion in 2021 to USD 5.7 billion by 2026, at a Compound Annual Growth Rate (CAGR) of 20.4% during the forecast period[7]. In addition, in terms of end-use, the nano-satellite market is, and is expected to be, segmented as follows:



As to their diffusion worldwide, North America will very probably gain and maintain maximum revenue share thanks not only to space organizations such as NASA, USSF (United States Space Force), Kennedy Space Center, etc., but also to the increasing number of private space players. As to Europe, it is considered as "*the key manufacturer of spacecraft after the U.S.*"[8], with the European Union announcing investments that will boost the market growth in the region[9]. The Asia Pacific region is expected to grow rapidly, led by India and Japan; Africa and Latin America will very probably follow, with an expected growth[10] that is proving to be consistent with the described trends.

2. Alcor

Italy has been dealing with small satellites since the beginning of its space journey: San Marco 1, the first in-house built satellite that "*had a total mass of 115,2 kg*"[11], was launched on a U.S. Scout booster from Wallops Island (Virginia, USA) by an all-Italian team on 15 December 1964, as part of the San Marco Programme implemented between the early 1960s and late 1980s by the Italian Space Research Commission and La Sapienza University of Rome (Prof. L. Broglio and Prof. E. Amaldi). In the following years ASI launched a number of programs - as national initiatives, ESA optional programs or in collaboration with NASA - for the realization of nano-satellite missions and for the development of on-board equipment, thus conquering a leading position on the world scene.

So, today Italy is one of the leading countries in the field of scientific space research worldwide, thanks to excellent industrial and scientific-technological capacities that, under the coordination of the Italian Space Agency (ASI), are able to develop scientific instruments (payloads) for medium-large space missions, manufacture traditional and small satellites and perform the related ground operations.

Thanks to a large number of space-related high-tech SMEs, today Italy can count on a solid supply chain that is ready

7 https://www.marketsandmarkets.com/Market-Reports/nanosatellite-and-microsatellite-market-130496085.html.
8 https://www.fortunebusinessinsights.com/microsatellite-and-nanosatellite-market-104860.
9 "Market in Europe accounted for moderate revenue share in 2020, which is expected to expand at a rapid rate [...] Countries in Europe are more developed in terms of advanced technologies, and companies are investing substantially in development of nano satellite technologies, which is creating opportunities for nano satellite providers and boosting market growth. Europe is the largest investor in R&D for development of nano satellites, which is also driving growth of the market. In addition, many academic institutions, universities, and startups in Europe are collaborating with service providers to launch their own nano satellites" (https://www.emergenresearch.com/industry-report/nano-satellite-market).
10 https://www.fortunebusinessinsights.com/microsatellite-and-nanosatellite-market-104860.
11 https://nssdc.gsfc.nasa.gov/nmc/spacecraft/display.action?id=1964-084A.

to seize the great opportunities offered by this segment of the (new space economy) market and to respond to the reduced resources on board small satellites by promoting not only the miniaturization of components and payloads, but also the development of critical equipment, including power generation and management systems, propulsion, data transmission, attitude control and navigation tools, signal processing and transmission, advanced computers, up to the development of artificial intelligence capabilities. In addition, the new architectures are focusing on improving the interoperability of "*Space-Space and Space-Earth systems*"[12], with particular attention to ground and early warning operational capabilities.

In this context - convinced that appropriate investment in the development of operational missions based on a focused national technology roadmap[13] for the creation of an adequate and steady operating environment will be key to improve competences, develop sustainable satellite systems and place the country in a position of consolidated leadership -, capitalizing on an enduring national legacy rooted in a long history of national and international successful missions, in 2020 ASI launched a program specifically designed to support the development of micro- and nano-satellites by regularly opening ad-hoc calls aimed at stimulating projects and/or ideas in large system integrators (LSI), SMEs, start-ups and academy sectors.

The program was presented at the ASI headquarters on May 26 this year, along with its name, "*ALCOR*", a sort of "*branding*"[14] reflecting not only the Agency's commitment and will to repeat the initiative constantly in time and in parallel with traditional projects for (bigger) spacecraft, but also the idea - as ASI President Giorgio Saccoccia explained during the event – that, like Mizar's fainter companion star in the constellation of Ursa Major, small satellites can be used in stand-alone missions or in combination with traditional and more performing satellites, in both cases providing great opportunities to the country as a whole. Which, consistently with the widespread approach to Alcor and Mizar as a "*vision test*"[15], demonstrates how farsighted Italy's vision is, since small satellites can be employed for different purposes, from the civil to the defense and military sectors, confirming once again the increasingly strategic role of the space domain and of such category of spacecraft.

In this perspective, the Alcor program is aimed at supporting ground-breaking technologies in the fields of new materials and processes, on-board equipment, payloads, robotics and artificial intelligence, control, miniaturization and midstream techniques for future long-term (i.e. >5 years) space missions; at bringing to maturity technologies and/or services under development through in-orbit demonstration, thus helping reduce time-to-market and costs; at enabling new architectures and missions based on synergies with existing (traditional) systems; and, last but not least, at positioning itself as a multi-disciplinary business incubator where start-ups, enterprises and industry associations can find all the necessary support for their (desirably joint) prototypes of innovative service platforms to reach developers and, afterwards, national and international markets and users, sustainably and within shorter periods of time.

12 https://www.asi.it/wp-content/uploads/2022/05/2022_04_28-DEL-052-PTA-2022-2024.pdf, pg. 119.
13 AirPress n. 134, June 2022.
14 Ib., pg. 5.
15 "There's one famous double star that you might be able to split with your eyes alone: Mizar and Alcor [...] in Ursa Major [...] After a moment or two of careful looking, [...] many people are able to see two distinct stars, with a faint star (Alcor) just a short distance from the much brighter Mizar" (https://skyandtelescope.org/observing/celestial-objects-to-watch/meet-mizar-and-alcor-the-horse-and-rider/).

3. Powering the innovation and technological creativity flywheel with nano-satellites at the Italian Space Agency

During the SPACE19 + ESA ministerial meeting held in Seville in 2019, Italy confirmed its participation in the optional ESA General Support Technology Program-GSTP Fly Program dedicated to in-orbit cubesat missions and aimed to enable "*missions by making sure the right technology, at the right maturity level is available at the right time*"[16]; according to the implementation rules of such program, each Member State can support an activity that meets specific national needs, which is then assigned by ESA according to its own procurement policy.

Consistently with the decision to participate in the GSTP Fly Program - as well as, among others, with the Space Factory 4.0 initiative defined in the Italian Recovery & Resilience Plan ("*Piano Nazionale di Ripresa e Resilienza* - PNRR") aimed at boosting the competitiveness of the small-satellite sector by fostering an entrepreneurial domestic ecosystem of about 200 companies and 7,000 employees - in autumn 2020 ASI launched the "*Future cubesat missions*" call for tenders[17] in order to award procurement contracts for cubesat in-orbit demonstrations and technology flight opportunities. The selection criteria[18] ranged from the degree of originality of the proposed mission concept and/or innovativeness of the idea or technologies involved - especially in relation to the current state of the art and the national, European and extra-European scenario - to the feasibility and maturity degree of each project/mission in the short and medium term (3-5 years) compared to the current level of maturity and development of the technologies involved, the level of the proposing team, the clarity and verifiability of the project objectives and related risk analysis; the potential scientific or technological outcomes, in terms of advancement or opportunities for new applications in the user segment involved; and, finally, the strategic positioning of the proposed initiative, including the related potential synergies and connections with institutional strategic programs and European and national priorities, the latter possibly including also the creation of a supply chain program bringing together universities, research institutions, large companies, SMEs, etc., so as to develop and launch ambitious medium- and/or long-term sustainable research projects.

"*Nanosatellites*" - said Silvia Natalucci, Head of the ASI Micro- and Nano-satellites Organisation Unit - *"can be defined as a 'game changer' within the entire space industry, as they have revolutionized the market and, thanks to their very reduced costs and development time, even the very way in which they are produced. They have also contributed in an important way to the so-called democratization of space, that is, allowing even small companies to become part of a sector that was closed to them until recently* "[19]. And, should that not suffice, "*there are also many challenges to work on to further overcome current limits, including the development of autonomous navigation that can reduce the costs of in-orbit operation or develop antennas with higher data transmission speeds*"[20].

In reply to the call, ASI received 49 proposals from a total of 22 participating research centres and universities and 78 enterprises - mostly SMEs -, covering a wide range of domains: from science and applications to remote sensing, space weather, internet-of-things, in-orbit servicing, space surveillance and tracking, particle and high-energy astrophysics, cosmology and service-oriented systems/architectures.

16 "*GSTP performs its activities under three distinct elements: Develop, Make and Fly. Activities are mostly divided depending on where the technology need originated from*" (https://www.esa.int/Enabling_Support/Space_Engineering_Technology/Shaping_the_Future/About_the_GeneralSupport_Technology_Programme_GSTP).
17 https://www.asi.it/wp-content/uploads/2020/08/Bando-Cubesat.pdf.
18 Ib., pg. 10.
19 https://newsrnd.com/tech/2022-05-27-italy-focuses-on-nanosatellites--alcor-is-born.ryHBzbCDc.html.
20 Ib.

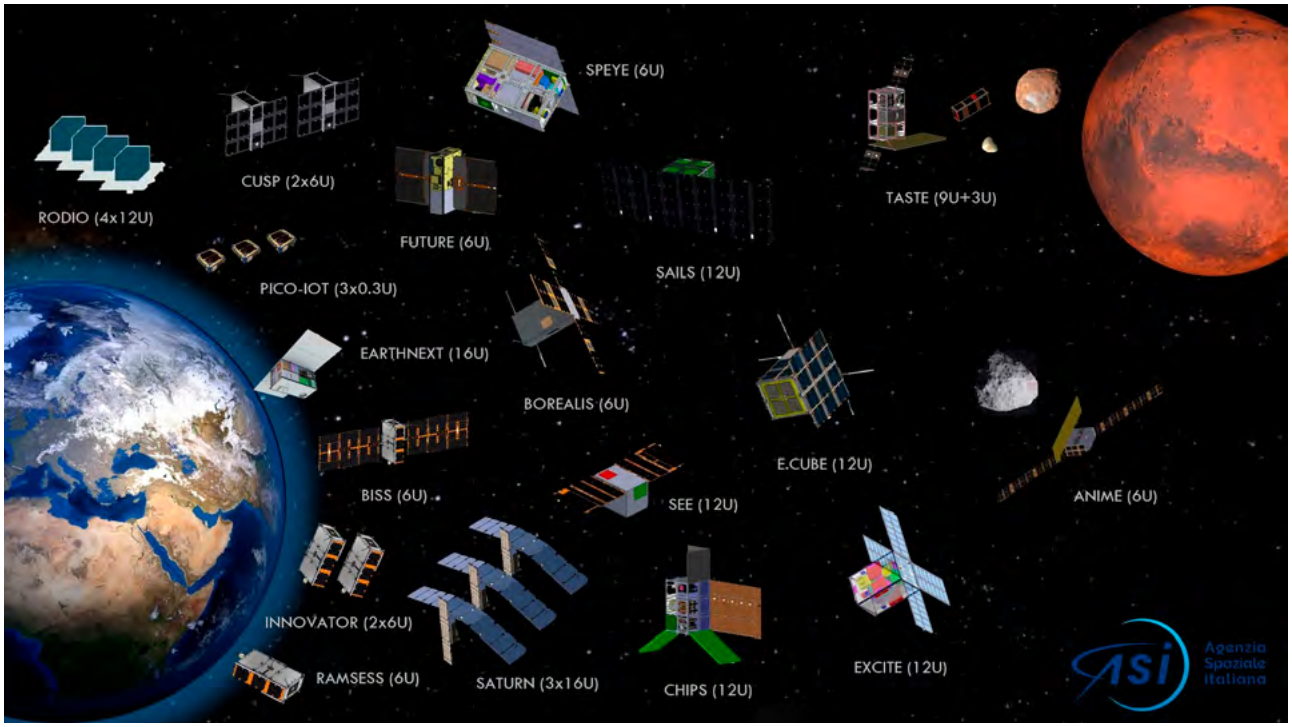


Photo credits: Italian Space Agency

Given the success of the initiative - which demonstrates the great interest in the cubesat segment by the industrial and scientific community - and despite the complex assessment process of the highly technical and heterogeneous proposals received, ASI finalized the selection in a very short time, with the aim of negotiating the terms of each respective contract with the 20 selected suppliers as quickly as possible. The proposed and selected projects to be funded - with over 100 million € in total, "*either through ESA GSTP program or, when available, national resources. An incremental approach is adopted in this case by funding the mission up to phase A/B and then, if promising results are achieved, for the following phases*."[21] - are[22]:

21 G. Leccese, S. Natalucci, A. Fedele, V. Cottini, "Overview and Roadmap of Italian Space Agency Activities in the Micro- and Nano-Satellite Domain" (https://dl.iafastro.directory/event/IAC-2022/paper/69210/).

22 https://www.asi.it/wp-content/uploads/2020/08/Esito-Valutazione-Tecnica-Cubesat-ver2_signed.pdf.

CODE	PRIME CONTRACTOR	NAME
16	IMT s.r.l.	BISS
28	Politecnico di Milano	VULCAIN
26	OHB Italia S.p.A.	SATURN
7	Argotec S.r.l. Società Unipersonale	HENON
25	Officina Stellare S.p.A	EarthNext
17	INAF-Istituto di Astrofisica e Planetologia Spaziali	CUSP
39	TYVAK International s.r.l.	FUTURE
15	GP Advanced Projects srl	PiCo-IoT
40	Università degli Studi di Napoli Federico II - Dipartimento di Ingegneria Industriale	RODIO
49	INAF-Osservatorio Astronomico di Arcetri	TASTE
36	Techno System Developments s.r.l.	SPEYE
46	INAF-Osservatorio Astronomico di Roma	ANIME
11	Dipartimento di Fisica Università degli Studi di Roma "Tor Vergata»	SEE
12	Distretto Tecnologico Aerospaziale (in sigla DTA) s.c.a.r.l.	INNOVATO R
5	Alma Mater Studiorum -Università di Bologna	BOREALIS
47	INAF-Osservatorio Astronomico di Brera	CHIPS
9	CIRA S.c.p.a.	RAMSESS
10	D-ORBIT S.p.A.	E.CUBE
30	Radarsensing s.r.l.	SAIL
41	Università di Pisa	EXITE

Finally, sharing a high level of maturity of the technologies involved as well as a remarkable degree of consistency with national and European strategic priorities in each respective reference sector, the 20 selected final proposals are expected to introduce significant advancements in the operation of small satellites, thus contributing to the objective of consolidating Italy's role of excellence in such a critical and strategic area of the national space community, with a flywheel effect extending even to space diplomacy, since they will facilitate international collaborations and help strengthen the renowned country's capacities for bringing peace and prosperity on Earth and in space, because – as already observed - the "*synchronization of our space-related work will allow State to lead… efforts with global allies and partners and to support other more targeted undertakings throughout the interagency, as well as within the scientific, commercial and academic realms*"[23].

23 https://afsa.org/boosting-space-diplomacy-state.

Rising Opportunities in the Satellite Connectivity Market: Eutelsat and OneWeb Combination*

*by Sara Dalledonne***

1. Eutelsat in position to combine with OneWeb

On November 14th, 2022, Eutelsat and the main OneWeb shareholders signed the Final Agreement related to the combination of the two companies.[1] The deal is the result of an increasing involvement of Eutelsat in OneWeb in the past few years. In March 2021, Eutelsat announced a $550 million equity investment in OneWeb, while the company increased its share in OneWeb in October 2021, becoming its second-largest shareholder, with a 22.9% stake.[2] On March 22nd, 2022, Eutelsat announced a global multi-year Distribution Partnership Agreement (DPA) with OneWeb, which paved the way for the commercialisation of OneWeb services across key connectivity verticals including maritime, enterprise communications, aviation, consumer broadband, and Government business segments.[3] On July 26th, 2022, Eutelsat and OneWeb signed an MoU to combine in an all-share transaction OneWeb's LEO satellite constellation with Eutelsat's orbital fleet in GEO.[4]

Figure 1: *Eutelsat/OneWeb Investment and Partnership* (Source: ESPI)

The British government owns approximately 18% of OneWeb after investing $500 million in 2020 to rescue the company from bankruptcy, alongside OneWeb's largest shareholder, Indian Bharti Global, which also invested around $500 million and owns 30% of the company. On the other hand, Eutelsat's largest shareholder is France's state-owned investment bank Bpifrance, with a 20% stake. Other Eutelsat´s shareholders include FSP, Lazard Asset Management Pacific Co. and CMA-CGM.

The deal is branded as a merger of equals with shareholders of both companies owning 50% of the combined entity. The two firms will keep their respective headquarters in the UK and in France, while the merged group, listed in France, will also apply for being listed in the UK. The combined entity will have balanced governance.

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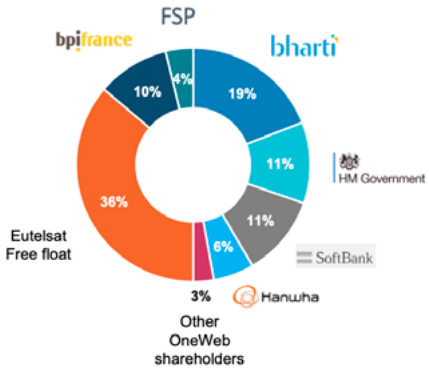
1 Eutelsat, Signing of the Final Agreement Relating to the Combination Between Eutelsat and Oneweb (November 2022). Link: https://www.eutelsat.com/en/news/press.html#/pressreleases/signing-of-the-final-agreement-relating-to-the-combination-between-eutelsat-and-oneweb-3217553.

2 Eutelsat, Eutelsat raises its shareholding in OneWeb . Link: https://www.eutelsat.com/files/PDF/investors/2021-22/PR_2130_OneWeb.pdf

3 Oneweb, Eutelsat and OneWeb sign global distribution partnership to address key connectivity verticals. Link: https://www.eutelsat.com/files/PDF/investors/2021-22/CP_EN_Eutelsat_OneWeb_2607.pdf.

4 Eutelsat, https://oneweb.net/resources/eutelsat-and-oneweb-sign-global-distribution-partnership-address-key-connectivity. LINK: https://www.eutelsat.com/files/PDF/investors/2021-22/CP_EN_Eutelsat_OneWeb_2607.pdf.

Figure 2: *Eutelsat Pro Forma Shareholding* (Source: Eutelsat)



The transaction is expected to be completed indicatively in the next six-to-nine months pending antitrust and regulatory authorizations, in particular the approval by the competition watchdogs and an extraordinary general meeting of companies' shareholders.[5] In January 2022, the new UK National Security Review came into force in the framework of the UK National Security and Investment Act 2021 (NSI Act). As part of the recently introduced procedure, the British government was requested by the House of Commons Defence Committee to conduct strict scrutiny of the combination to ensure it poses no risk to the UK's national security.[6]

The combined entity would be a multiorbital satellite operator to provide integrated GEO and LEO solutions and services, with the goal of capturing the fast-growing Satellite Connectivity market. The deal highlights the ambition of the two companies to leverage the complementarity of Eutelsat's 36 GEO satellites with OneWeb's 648 LEO assets in tackling the booming demand for connectivity across verticals such as aerial and maritime mobility, fixed data and government services, also building on the development of 5G and cloud technologies. Eutelsat has expended more than $500 million in the Konnect VHTS GEO satellite, focusing on the B2C market, with the aim of improving broadband coverage in Europe.[7] The company has recently launched EUTELSAT 10B satellite,[8] and contracted Thales Alenia Space to build a next-generation Flexsat to increment capacity over the Americas.[9]

However, the company recognised LEO capability's potential for B2B and B2G markets, including mobility, with low-latency requirements and that a full combination of LEO and GEO assets would address Eutelsat's need for growth to offset the limited perspective on the GEO satellite broadcast business. On the other hand, it is in OneWeb's interest to secure $2 to $3 billion to expand its constellation with Gen-2 constellation, leveraging Eutelsat´s interest in LEO-based connectivity solutions and readiness to invest in this domain.

The stock market reaction to the announcement of a potential all-share combination saw Eutelsat shares fall to their lowest in two years, dropping 15% after plunging more than 17% the day before. Eutelsat CEO, Eva Berneke, suggested that the stock's fall was a result of an unexpected announcement "*which created a lot of uncertainty on the market*".[10]

5 Eutelsat, Eutelsat Strategy Update on the proposed combination with OneWeb (October 2022). Link: https://www.eutelsat.com/en/news/press.html#/pressreleases/eutelsat-strategy-update-on-the-proposed-combination-with-oneweb-3210411.

6 UK Parliament, Defence's lack of progress in space domain "unacceptable" and UK "lagging behind Italy (October 2022). Link: https://committees.parliament.uk/committee/24/defence-committee/news/173684/defences-lack-of-progress-in-space-domain-unacceptable-and-uk-lagging-behind-italy/.

7 Space Intel Report, Eutelsat to European Commission: Take a look at us now (September 2022). Link: https://www.spaceintelreport.com/eutelsat-to-european-commission-take-a-look-at-us-now/.

8 Eutelsat, Eutelsat 10B. Link: https://www.eutelsat.com/satellites/future-satellites.html.

9 Thales Alenia Space, Eutelsat Selects Thales Alenia Space to Build a New Flexible Software-Defined Satellite. Link: https://www.thalesgroup.com/en/worldwide/space/press_release/eutelsat-selects-thales-alenia-space-build-new-flexible-software.

10 Reuters, Eutelsat shares fall for second day on 'game-changing' deal with OneWeb. https://www.reuters.com/markets/deals/eutelsat-

Arguably, Eutelsat's declaration that the company will suspend dividends for the coming 3 fiscal years with cash flow focused on Gen-2 constellation (while maintaining a strong balance sheet) also played a major role in shareholder's reaction. Eutelsat's stock price has now almost fully recovered, showing an increasing understanding of the potential of the combination.

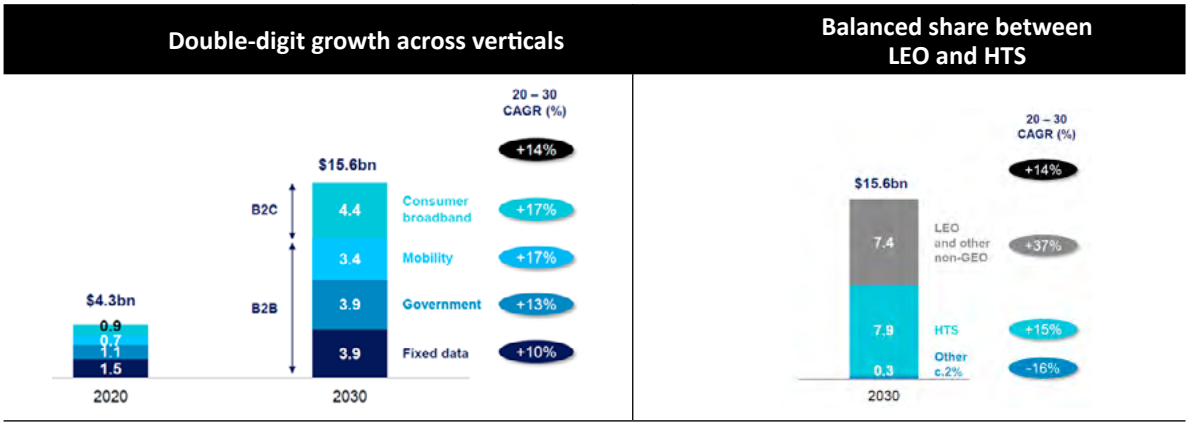
2. A new signal of the transformation of the satcom ecosystem

The merger is a clear sign of an entire satcom ecosystem under transformation as a result of various forces at stake, including adaptation to ongoing market shifts, technological advancement and change in industry approach.

2.1. Market shift

Satcom operators provide various solutions across various verticals, with direct-to-home (DTH) television traditionally representing the largest portion of the downstream segment of the space economy ($89.9 billion, the Space Foundation).[11] However, GEO satellite operators have experienced a slowdown in returns over the past five years and are trying to move from traditional GEO networks and services to a diversification of their revenue streams. While space connectivity solutions have been so far a secondary market, the combination highlights satellite operators' expectation that connectivity will become the new growth engine for the satcom business. Eutelsat projected a period of significant growth for Satellite Connectivity market with a triplication from $4.3 billion to $16 billion by 2030. It is estimated that the share of the Non-Geostationary (NGSO) market, mostly captured by LEO constellations, will grow 2.5x faster than the overall market, thus representing almost 50% of it by 2030. While the $16 B are mainly driven by considerations of commercial circumstances, the number needs to be contextualised into the much broader picture of the thriving digital economy.

Table 1: *Evolution of Satellite Connectivity market* (Source: Euroconsult, 2021)



2.2. Technologies advancement

Besides traditional GEO-based solutions to address communication markets, new entrants have sought to rely on an entirely different technological approach, focusing on large satellite constellations in LEO. Eutelsat's approach to the transaction shows that well-established satcom operators see imminent value in integrating such an approach to complement their system architecture. An attempt towards this type of market integration already occurred in 2017, when Intelsat announced a merger with OneWeb with the goal to become a global telecommunication leader providing multiorbital solutions. The deal was unsuccessful, and both companies ultimately filed for Chapter 11 bankruptcy in 2020. In addition, SES already pursued a multiorbital solution in 2020, acquiring O3B MEO Networks. SES has also more recently

britainsoneweb-sign-initial-merger-deal-2022-07-26/.

11 ESPI, Yearbook 2021. Link: https://www.espi.or.at/yearbooks/.

acquired 25% in UN:IO, which is a multiorbital network service provider consortia,[12] and partnered with ESA, supported by the European Commission, to design the EAGLE-1 system for secure Quantum Key Distribution (QKD).[13] It will be a significant challenge for operators to effectively implement integrated multiorbital solutions from a technical perspective.

2.3. Industrial approach

The approach developed by some of the new entrants, such as SpaceX and Amazon, goes one important step further and establishes vertically integrated processes where the connectivity solution is part of a vertically integrated market (e.g., e-commerce and autonomous driving). On this side, at present other established satcom operators such as Eutelsat and OneWeb show no signs of wanting to develop such an approach. Furthermore, several IT companies such as Apple, T-Systems and Samsung have expressed their interest in satellite telecommunication: for instance, Apple has reached an agreement with Globalstar to use 85% of its satellite network capacity to provide "Emergency SOS By Satellite", and the service is currently available with the iPhone 14 in the US and Canada.[14] In addition, recent examples of horizontal mergers, such as for instance the British company, Inmarsat, planning to merge with the US Viasat to propose multiorbital solutions – with Inmarsat's global ORCHESTRA network integrating Inmarsat's existing GEO networks with terrestrial 5G and NGSO satellites[15] – also suggest a reconstruction of the ecosystem with fewer competitors.

3. Further challenges on the horizon

The proposed combination between the companies is expected to strengthen their position in the tense competition between satcom providers, thus feeding the challenge to create a stronger European competitor to SpaceX's Starlink and Amazon´s Project Kuiper, and in the emerging connectivity market that combines satcom and terrestrial solutions. Questions remain on how many operators the market can absorb.

The success of satcom operators will also be strongly dependent on their capacity to secure the appropriate spectrum and launch capabilities in the short to medium term. OneWeb has global high-priority access to the spectrum in Ku-band. However, SpaceX and OneWeb recently engaged in a dispute with Dish Network and spectrum holder RS Access, claiming their use of 12 GHz for 5G service can disrupt their incumbent satellite services.[16] Secondly, following the decision taken by Western countries in March 2022 to no longer rely on Russian launches, OneWeb policy to access space has been transformed to ensure diversification of its launch service providers.

Finally, some strategic questions can be raised on whether and how the Eutelsat-OneWeb company will fit in the newly created EU's space-based secure connectivity programme, called Infrastructure for Resilience, Interconnectivity and Security by Satellite (IRIS2).17 And, ultimately, on how the EU will leverage the market dynamics to allow "*the private partner to complement the Programme infrastructure with additional capabilities to offer commercial services on market conditions through additional own investments*", while also making to pursue its own interest of ensuring non-dependence, sovereignty and security.

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12 Space Intel Report, SES joins NewSpace group bidding on EU constellation but also remains on established-company team. https://www.spaceintelreport.com/ses-joins-newspace-group-bidding-on-eu-constellation-but-also-remains-on-established-company-team/.

13 SES, SES, ESA and European Commission partnering to Deliver Satellite Quantum Cryptography System for European Cybersecurity. https://www.ses.com/press-release/ses-esa-and-european-commission-partnering-deliver-satellite-quantum-cryptography.

14 Globalstar, Apple's Emergency SOS link puts it in the satellite fight with SpaceX and more (September 2022), and Via Satellite, Apple Says SOS Available via Globalstar Satellites. Link: https://www.satellitetoday.com/telecom/2022/11/15/apple-says-sos-via-satellite-is-now-available-via-globalstar-satellites/.

15 Space Intel Report, UK regulator, worried Viasat/Inmarsat merger will smother in-flight connectivity competition, threatens in-depth review (October 2022). https://www.spaceintelreport.com/uk-regulator-worried-viasat-inmarsat-merger-will-smother-in-flight-connectivity-competition-threatens-in-depth-review/.

16 Space Intel Report, France asks ITU to label Russia Ukraine invasion as force majeure, OK extension for OneWeb Q/V satellite (June 2022). https://www.spaceintelreport.com/france-asks-itu-to-label-russia-ukraine-invasion-as-force-majeure-ok-extension-for-oneweb-q-v-satellite/.

17 Council of the EU, Council and European Parliament agree on boosting secure communications with a new satellite system (November 2022). https://www.consilium.europa.eu/en/press/press-releases/2022/11/17/council-and-european-parliament-agree-on-boosting-secure-communications-with-a-new-satellite-system/.

Miscellaneous Material of Interest

The Proposal for the New Italian National Airport Plan: Opportunities and Objectives
by Carla Bonacci and Francesca Melega

Introduction to Air Law, Eleventh Edition.
by Pablo Mendes de Leon – book review by Anna Masutti

The Law of Unmanned Aircraft Systems, Second Edition
by Benjamyn Scott – book review by Agata Di Guardo

La Just Culture Aeronautica nel Sistema Penale Italiano. Una Difficile Integrazione.
by Marco Di Giugno Marco and Michele Pilia – book review by Anna Masutti

The Proposal for the New Italian National Airport Plan: Opportunities and Objectives

by Carla Bonacci and Francesca Melega***

1. Introduction

The proposal for the new Italian National Airport Plan (NAP) [1] aims at establishing, by enhancing a future intermodal integration between air, highway, port and, especially, rail transport, the first chapter of a more extensive General Transport and Logistics Plan[2].

The proposed NAP has been set up in a scenario where the industry of transport, in particular the air one, was severely hit firstly by the economic impact of the Covid-19 induced pandemic (which caused passengers air traffic to decrease by more than 70% in the years 2020-21 compared with the previous period) and, more recently, by the undergoing Ukrainian conflict (due to the imposed sanctions, restricting connections with Russia and overflight of several Countries). In this context, the new proposed NAP foresees a path, looking ahead to 2035, which does not limit itself to bring the airport industry back to pre-pandemic conditions, but which allows its evolution, on the basis of unavoidable cornerstones, such as environmental sustainability, intermodality, digitalization and technological innovation.

2. Environmental sustainability

In relation to the environmental sustainability issue, the proposed NAP, building on the ICAO program's goals of decarbonization of the sector before 2050, restraints of noise emissions and reduction of the international aviation impact on climate change, proposes several actions which each airport will have to implement to adequate its infrastructures, therefore allowing air operators to use both Sustainable Aviation Fuel (SAF) and other types of sustainable power supply (electric, hydrogen, etc.), and, more generally, enhancing the resilience of the infrastructures themselves to the effects of global warming.

Pursuing the aim of reconciling air transport and environmental protection, the NAP proposal, on the one hand, recalls the limits related to airport noise iso-level curves, to mitigate acoustic impact on citizens (especially those living in big cities where, due to the larger size of airports, issues related to noise emissions are frequent) and, on the other hand, indicates the minimum quotas of airports' sustainable accessibility, supporting different forms of intermodality including not only rail transport but also the use of electric and hydrogen vehicles.

Furthermore, considering the outcomes of the SEA (Strategic Environmental Assessment) procedure, the proposed NAP analyses the infrastructural endowment that each individual airport needs to ensure potential market demand satisfaction, while respecting, however, environmental and safety limits. Such approach, by highlighting the existing limits to the development capacity of individual airports and the unexpressed potential of neighbouring airports, allows at the same time the identification of potential margins for the establishment of airport networks.

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** Trainee lawyer, RP Legal & Tax.

1 In October 2022, the draft of the new NAP has been shared for public consultation. Link: https://www.mit.gov.it/comunicazione/news/aeroporti-il-piano-nazionale-consultazione-fino-al-21-novembre-2022.

2 The General Transport and Logistics Plan (GTLP) contains the strategic guidelines for the policies of people and cargo's mobility as well as for the Country's infrastructural development. The Plan is adopted, under proposal of the Ministry of Infrastructures and Transport, through a d.P.R., upon deliberation of CIPE, having obtained the opinion of the Unified Conference and after the consultation of the competent parliamentary Committees; see D.lgs. n. 50/2016, art. 201. Link: GU Serie Generale n.91 del 19-04-2016 - Suppl. Ordinario n. 10.

3. Airport networks

In order to achieve the goal of national air transport network rationalization, the proposed NAP supports the establishment of several airport networks, identified on the basis of specific criteria such as sharing of same catchment area and presence of adequate levels of accessibility and connectivity of involved airports. The current national network implementation will allow, by pursuing common and coordinated objectives, a more efficient traffic distribution and the satisfaction of present and future mobility demand.

4. Potential of smaller airports

To this end, the results of the analysis contained in the proposed NAP showed how smaller airports have lower expected passenger traffic growth rates compared to those forecasted for larger airports. At the same time, none of the airports with more than 7 million passengers have significant spare capacity at peak, while smaller airports show a good reserve capacity.

Therefore, the NAP proposal highlights the pivotal role played by smaller airports, of which an efficient and synergic exploitation, guaranteed by the establishment of airport networks, may contribute to meet the goal of maximizing smaller airports' yield, enhancing the peculiarities of each individual airport and contributing at both traffic dilution and management conditions improvement for larger airports.

5. Intermodality

Another key element to satisfy mobility demand on national land and to allow an effective accessibility to airport network for citizens is the full implementation of the intermodal integration, in particular for railway. To this scope, a significant contribution is given by, on the one hand, strengthening existing railway infrastructure and, on the other hand, exploiting new direct rail connections to airports, according to the program defined through the "*Program Contract – Investments Part*" of Rete Ferroviaria Italiana (RFI) S.p.A., the Italian railway network.

6. Technological innovation

Lastly, the proposed new NAP highlights the importance of the development and, hence, the investment into new forms of transport and services, i.e. Advanced Air/Urban Mobility (Advanced Air Mobility – AAM/Urban Air Mobility – UAM), in order to realize an efficient and low-impact intermodal integration.

7. Conclusion

On October 19, 2022, the Italian Civil Aviation Authority (ENAC) shared the proposal for the new NAP to enhance the public consultation by interested stakeholders. The latter were given the opportunity to share their observations until the end of 2022 and, in the upcoming months, the Authority will amend the contents of the new NAP accordingly, as to draft its final version.

Introduction to Air Law, Eleventh Edition

*by Pablo Mendes de Leon**

*book review by Anna Masutti***

The eleventh edition of Introduction to Air Law, by Professor Pablo Mendes de Leon, is a precious source of legal theories, references to recent case law and doctrine. Since the publication of the tenth edition five years ago, the sector has moved on rapidly: market access and market behaviour by air carriers, case law in the area of air carriers' liability, environmental concerns, new perceptions of security and safety in relation to the transparency of accident investigations, the rights and obligations of passengers and new methods for aircraft financing have significantly evolved. New aspects pertain to airport liability, subsidies and bankruptcy of airlines, as well as the role of labour relations in air transport, cybersecurity and privacy have spawned a new and increasing attention. These and many other aspects have been carefully assessed by the Author, who, in the latest edition of the book, brilliantly frames the relationship between air law and the technological developments occurred in recent years, dealing with new key regulatory challenges in the sector.

Thanks to its broad and thorough analysis, the entire book enriches the knowledge of experts, practitioners and academics, providing a valuable working tool which, thanks to its structure and clarity, encourages the consultation of this fascinating and dynamic field.

From chapter 1, the Author emphasizes the relevance of the subject, providing the definition of air law, analysing the developments that have taken place over more than 100 years of codification of its rules and highlighting its autonomy from the multiple rules of the international and national regulatory framework. In the introductory chapter, the Author clarifies the principles governing air law, essential criteria for guiding through this complex field. Furthermore, chapter 1 tackles the most recent developments in the sector and the latest initiatives taken at international level, capable of having relevant repercussions on its evolution.

As anticipated, the book is a perfectly structured book which takes into account not only traditional topics as governed by the international Conventions, but also the regulation of international air services and of air carriers' liability, the subsequent implementation rules that have been issued at national level and the most relevant case law emerged in contracting States. This, without neglecting the technological developments occurred in the sector.

Chapter 2 deals with international air services, analysed in detail, starting from their origin and definition, and describing their evolution at the international and EU level. The Author focuses on the compliance of the same services with safety and security standards and with competition rules, to then focus the analysis on the detailed description of the liberalization processes that have characterized international air services and the most recent developments in the EU context.

In this regard, the entire chapter 3 has been devoted to the evolution of air law in Europe over the past decades, with an exhaustive and comprehensive analysis on the implications of State aid and competition law in this context. Nothing has been left out in the volume since – assessing the application of competition rules to the sector, their repercussions in the market, the development of low-cost carriers and the evolution of the most relevant case law on State aids – the Author has thoroughly examined how these developments have marked the current structure and distribution of air traffic in European airports.

An important section of the volume, chapter 4, is dedicated to private aviation law. In this chapter the Author explores in detail the entire and complex regulatory framework governing air carriers' liability, up to and including the 1999 Montreal Convention. The analysis of case law developments is detailed since, on the on hand, it considers decisions applying the prime regulatory framework of air carriers' liability and, on the other hand, it specifically compare it with the latest regulatory regimes emerged at the international level.

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* Introduction to Air Law, Eleventh Edition, Pablo Mendes de Leon, Kluwer Law International, The Netherlands, 2022, ISBN: 9789403546834.

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Following the book, Chapter 5 provides a comprehensive overview of the regulatory state of the art on passengers' protection, rights and obligations. Once again, the Author proves his incomparable knowledge of the subject, providing relevant regulatory references and traditional and innovative academic theories, without neglecting precious information on the most recent case law of European and international Courts that, at present, are not witnessed in any other volume of equal standing.

Offering another valuable point of view, chapter 6 provides an in-depth analysis to the Global Safety Regulation, while the following chapter 7 deals with the Regional Safety Organization. In these sections, the early regulatory interventions adopted internationally and, in particular, by the International Civil Aviation Organization (ICAO) are meticulously reported, capturing the attention thanks to the high-level exposition and detailing their implementation processes in the various contracting States of the 1944 Chicago Convention. To complement the exposition, European Union regulations and guidelines on aviation accidents and their implications are thoroughly analysed.

In the prosecution, chapter 7 gives extensive emphasis to the issue of Just Culture in the aviation sector which, however, suffers from a lack of adequate regulation. Nevertheless, the Author is able to address the topic moving on from the existing international and EU labour law, analysing its primary sources and critically discussing social policies, between harmonization and minimum standards. The analysis then focuses on the latest technological developments adopted in the field, comprehensively discussing the international and EU regulatory framework on Unmanned Aircraft Systems (UAS), the ever-increasing need to prevent cyber-attacks and the issue of violations of data protection rules.

In chapter 8, the Author deals with the regulatory framework of product liability in civil aviation and with the evolution of manufacturers' liability regime in the U.S. and Europe, bearing strong resemblance to their earlier iterations and yet including important updates and relevant innovations that have taken place over the years. The strategic description of the different liability regimes also extends in the following chapter 9, focused on the regulatory framework – and its evolution – of third-party damage on the surface. In this chapter too, the Author offers precious references to case law from several jurisdictions. This analysis devotes equal and greater attention in explaining the approaches adopted in different States with respect to catastrophic events, such as aviation accidents.

Likewise, chapter 10 focuses comprehensively on aviation insurance and its regulatory framework, while the following chapter 11 sets out the Rights in Aircraft regime. The inclusion of this chapter results to be of crucial importance, since no other systematic volumes of air law comprises such a clear analysis of these issues, which is very useful to practitioners and scholars in the field.

The comprehensiveness of the topics covered is further confirmed by the final chapters, chapter 12, which examines each relevant aspect of criminal air law, starting with an thorough description of the existing regulatory framework at the international level, dealing with the repercussions of the failure to fully implement certain aspects of internal relevance, also in order to protect the peaceful operation of air transport from external attacks.

In conclusion, the Author offers once again an invaluable volume, capable of reporting on each relevant aspect of the dynamic and ever-evolving air law field and whose consultation is essential to have a complete, thorough and accurate overview of the regulatory and policies rules governing the sector.

The Law of Unmanned Aircraft Systems, Second Edition

*by Benjamyn Scott**

*book review by Agata Di Guardo***

The Law of Unmanned Aircraft Systems, Second Edition, by Benjamyn Scott, is a collection of essays on Unmanned Aircraft Systems (UAS) written by distinguished *alumni* and friends of the International Institute of Air and Space Law at Leiden University. Prof. Dr Pablo Mendes de Leon, former director of the Institute, wrote the preface to the first edition of this excellent book, acknowledging the huge work of Dr Benjamyn Scott, the editor-in-chief, for bringing together authors from all over the world, who have dedicated diligent attention to the different profiles of UAS. In his introduction, Prof. Mendes de Leon emphasised the challenges and the need to keep up with the rapid progress of UAS in the technical, economic and legal spheres. Yves Morier, retired UAS expert from the European Union Aviation Safety Agency (EASA) and the French Civil Aviation Authority (CAA), wrote the foreword to this second edition of the work, pointing out that the use of UAS in the civil sector really started after 2010 when small quadcopters appeared on the market. Since 2016, the UAS industry has continued to expand with a multitude of new uses and can claim to be one of the few branches of aviation that have not been severely affected by the COVID-19 crisis. To name a few of these new uses, for example, Mr Morier cites last mile delivery with small UAS, medical deliveries, UAS as education tools in STEAM studies, but also describes the importance of U-space development as a necessary concept to scale UAS operations and facilitate beyond visual line of sight operations and the challenge of Advanced Air Mobility (AAM). In all this, regulations play a crucial role, especially those that are performance and risk-based, like the European ones. Morier emphasises, therefore, that the merit of the book is precisely its all-encompassing nature, as it really deals with many of the issues that are relevant to Unmanned Aircraft.

The book is divided into six parts and includes 43 chapters. The First part of the book is dedicated to the general introduction of the subject matter. Part I consists of three chapters, of which Chapter 1 is an introduction written by the editor himself who did an extraordinary job in putting this book together, choosing the right topics to be discussed by the right authors. In this chapter, the author makes a brief but comprehensive historical examination of the military origins of UAS and their increasingly cross-cutting uses in the civil, state and private-non-commercial sectors. As the emerging UAS sector will have a significant impact not only on the aviation industry, but also on jobs and the economy at large, the author notes the current absence of a clear regulatory framework governing UAS across the world. The purpose of the volume is, in fact, to critically examine the current legal situation and policies concerning the regulation of UAS, as well as indicate trends and areas of concern for the numerous stakeholders.

Chapter 2, 'Terminology, Definitions and Classifications' is drafted by Dr Scott and Giowana Nunes de Pinho Veloso, Editorial Assistant at the *Air & Space Law* journal. This is a very useful tool. It is indeed important to understand the meaning of the different terms and to apply them correctly. Terms, such as Unmanned Aircraft, Drone, Pilotless Aircraft, Unmanned Aerial Vehicle, Remotely Piloted Aircraft, Remotely Operated Aircraft, Unmanned Drone, Model Aircraft and Toy Aircraft, are sometimes used interchangeably, but this promiscuous use can lead to confusion and have significant legal consequences. Using the wrong term could lead, for example, to the inclusion of the entire system in a contract, the exclusion of certain aircraft from international conventions or the application of additional rules in different circumstances. It is, therefore, important to understand the differences between the terms and apply them correctly. The authors in this regard also provide a useful explanatory table of terms at the end of the chapter and as a result of this analysis opted to use the term 'unmanned aircraft' to refer to the aircraft component and the term UAS to include also the system.

Chapter 3 is written by Dr Mikko T. Huttunen, Senior Researcher at the Faculty of Law, University of Lapland in Finland, and is focused on UAS as a case of applied socio-technological change involving the regulatory attitude of authorities

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such as the International Civil Aviation Organization (ICAO) and EASA. The purpose of the chapter is to demonstrate that UAS exemplify many of the typical legal issues that arise when a socio-technical change occurs, but also many of the typical legal solutions that can be undertaken to deal with the change. The author, thus, brilliantly frames the relationship between law and technology with reference to the illustrative case of UAS, identifying the types of regulatory approaches undertaken by EASA and ICAO, such as those of passivity, replication or emulation of existing rules, and the introduction of alternative rules, one of the most representative examples of which is the EASA rules on the categorisation of UAS operations into the three categories of open, specific and certified. Lastly, he dwells on the regulatory approach of transformation, *i.e.*, that of altering or repelling existing rules, resulting in what can be defined as regulatory reform.

The methodological and epistemological framework pioneered by Dr Mikko T. Huttunen in this chapter is highly appreciable, concluding with the need and importance for legal scholars and regulators to understand the value of definitions, categorisations and procedures embedded in regulatory legislation and practices, as these steer socio-technological change in certain directions that may be desirable or unsustainable.

As regards the remaining sections of the book, Part II is dedicated to safety issues; Part III is focused on security topics; Part IV presents a civil law section, Part V is focused on the stakeholder's activities and in Part VI, the national UAS laws of twenty-one countries are analysed.

More specifically, Part II begins with Chapter 4, in which Roberto Cassar, legal counsel at elseco Limited in Dubai, the United Arab Emirates, provides an interesting analysis of the applicability to unmanned aircraft of the principles of public international law, and in particular those governing *Jus ad Bellum* and *Jus in Bello*. He starts from two main questions: whether the same are to be considered weapons and whether they are subject to the rules related to the use or threat of use of force in the terms of Article 2(4) of the United Nations (UN) Charter, which provides *verbatim* that: 'All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations.'

The author, in critically analysing the international normative framework, which does not contain international treaties or customs *ad hoc* for the context of unmanned aircraft that prohibit or restrict their use in undertaking attacks, points out that the same are not inherently weapons; rather it is the weapons with which the vehicles themselves are equipped that can qualify as weapons.

Furthermore, with regard to the second question, whether unmanned aircraft are subject to the norms of Article 2(4) of the UN Charter, as has been seen, the same are not definable as weapons *per se*. However, the ICJ's interpretation of Article 2(4) and its exceptions under Article 42 (Security Council Authorisation for the Use of Force) and Article 51 (right of self-defence) are not to be referred to specific weapons. Therefore, if an unmanned aircraft is used in an act constituting the use or threatened use of force, Article 2(4) of the UN Charter would still apply, not least because the article does not require that a 'weapon' be used for its application.

The author's conclusions are lucid in the sense that as the military use of unmanned aircraft has increased and will continue to increase over time, the international community must not turn a blind eye. States should, however, hold each other accountable when questionable military activity involving unmanned aircraft is carried out; otherwise, the continued indifference or inaction of states could be dangerously interpreted as their tacit acceptance.

Chapter 5, written by Dr Fernando Fiallos, a diplomat and a PhD graduate from Leiden University, addresses the applicability of the 1944 Chicago Convention to UAS operations, emphasising from the outset the technological innovation introduced by UAS. Against the backdrop of an increasing number of civil uses of UAS, the author, therefore, poses some of the legal questions in the field of unmanned aviation that have remained unanswered by the civil aviation legal regimes and not much explored even in the legal literature. These questions are: How are UAS regulated under International Law? Are the provisions of the Chicago Convention on International Civil Aviation and its Annexes applicable to UAS? What are the legal challenges posed by UAS operations? What is the correlation between the Chicago Convention

and national civil aviation regimes with regard to UAS operations? Do the Chicago Convention and its Annexes require modernisation in order to incorporate UAS into their discipline? In order to answer these questions, the author makes a historical reconstruction of the international regulatory framework on UAS and then consequently analyses in depth the application of the Chicago Convention and its Annexes in relation to them, giving an account of the amendments on UAS incorporated into several of the Annexes, among which the new and amended SARPs in Annex 8 on Airworthiness of Aircraft that drives significant progress on the international safety and interoperability of UAS.

The author points out how unmanned aviation challenges the current legal and regulatory regimes of interstate civil aviation, as the absence of a pilot on board, or (even more) the total absence of a pilot in the case of Autonomous Unmanned Aircraft, challenges the application of the provisions of the Chicago Convention1944 and its SARPs, which were explicitly designed for manned aircraft.

In addition to the Rules of the Air in Annex 2 to the 1944 Chicago Convention, there are other rules and obligations that, under the 1944 Chicago Convention and its SARPs, UAS must comply with when engaged in cross-border operations, such as minimum safety distances, heights or cruising levels, particularly over cities, aerodromes or people. This situation creates safety problems due to the lack of a comprehensive set of SARPs specifically applicable to UAS. Dr Fiallos underlines that the already amended Annexes are not sufficient to address all the aspects that UAS require to operate safely.

Therefore, the safe and full integration of UAS into international civil aviation will definitely need the development of more specific SARPs, requiring all nineteen Annexes to the 1944 Chicago Convention to be amended to incorporate the new SARPs. To this end, the ICAO and its contracting states must continue to collaborate within the RPAS Panel and the Unmanned Aircraft Systems Advisory Group (UAS -AG). This will allow for a regulatory framework that is flexible enough to keep pace with the technological developments of UAS, support their safe and efficient integration into the international civil aviation system and focus on better-defined issues, whether technical, operational, or legal.

In chapter 6, Rita Sousa Uva and Gerli Rebane, both Legal Advisers in the Legal & Procurement Department at EASA, discuss in a very clear and fluent manner the European regulatory framework on Unmanned Aircraft. They point out the centrality of EASA regarding the operations of Unmanned Aircraft. In particular, they illustrate the EASA's mandate and competencies in the field of air transport as a shared competence between the EU and Member States. They start by citing the first regulation on common requirements in civil aviation, Council Regulation (EEC) No 3922/91, and Regulation (EC) No 1592/2002 establishing EASA itself, then tracing the different regulatory steps and their content leading to Regulation (EU) No 1139/2018. This Regulation extended the Agency's competencies in the direction of including a different portfolio of new regulatory, certification and enforcement powers in the specific field of Unmanned Aircraft, regardless of their Maximum Take-off Mass. The authors then dwell, in a clear and exhaustive manner, on the purpose and contents of Regulation (EU) No 1139/2018, analysing in more detail the essential requirements of Unmanned Aircraft, present in Section VII of Chapter III (Articles 55-58) of the Regulation. The authors also provide an overview of the contents of the Implementing and Delegated Acts, which the Commission adopted by virtue, respectively, of the provisions of Articles 57 and 58 of Regulation (EU) No 1139/2018, i.e. Commission Implementing Regulation (EU) No 2019/947 and Commission Delegated Regulation (EU) No 2019/945.

Finally, they also consider the EASA's regulatory material, consisting of the Acceptable Means of Compliance (AMC) and Guidance Material (GM), published after the issuance of Commission Delegated Regulation (EU) No 2019/945 and Commission Implementing Regulation (EU) No 2019/947, in order to facilitate the application of the aforementioned Regulation (EU) No 1139/2018 and the two delegated and implementing acts adopted on its basis.

The authors mention the latest change to affect the published AMC/GM, namely the Notice Proposed Amendment of the EASA 2021-09, published for public consultation. In closing, they also mention the U-space regulation, consisting of three Regulations, adopted by the European Commission and applicable from 26 January 2023, as a new step forward in the regulation of unmanned aircraft and their use of airspace.

The authors' conclusions highlight that the development of unmanned aircraft operations is still at an early stage and largely subject to ongoing new developments. Unmanned aircraft operations are, in fact, a relatively new concept, integrating technologies and infrastructures to adapt to such operations for various needs. They note that EASA continues to assess the need for action in the field of UAS, in particular with regard to the harmonised implementation of the regulations adopted for the 'open' and 'specific' categories, the development of the necessary regulations for the 'certified' category, and the safe and harmonised development and deployment of U-space service throughout the European Union.

In chapter 7 we once again find the signature of Dr Mikko Huttunen, who comprehensively and clearly deals with the key aspects of European U-space regulation, also outlining the profiles that still remain somewhat contradictory and open to further regulatory developments. In particular, the author very intelligibly outlines how U-space was established and gives a clear definition of it. U-space is, therefore, a broad concept, the core aspect of which is the airspace risk assessment conducted by the aviation authority, to create safety criteria, from an air traffic management perspective, for UAS operations in the designated U-space. It essentially boils down to a set of services that are arranged by designated entities in a given area to direct UAS traffic. It is a concept that is the result of a regulatory approach to the socio-technological innovation brought by UAS, which is that of alternative rules, but it also contains elements of a complete transformation with respect to the existing regulatory system for air traffic management (for an understanding of these regulatory approaches, please refer to the third chapter of the book, written by the same author).

U-space services will, therefore, not replace existing air traffic services (ATSs), but will introduce new ones.

The author then dwells on the flight information sharing system and on the role of common information services (CIS) and U-space services (USS) and on the rules for disseminating and exchanging information, giving an account of certain inconsistencies in the current regulatory framework with reference, for example, to the relationship between CIS and information exchange, since the U-space regulation does not expressly connect CIS with the provisions that establish the methods for sharing information between USSPs, ATSPs and competent authorities.

The author then explains the 4 mandatory services that U-space must provide, namely the Network Identification Service, the Geo-Awareness Service, the Flight Authorisation Service and the Traffic Information Service, as well as the two optional services that EU Member States may require USSPs to provide, namely the Weather Information Service and the Conformance Monitoring Service.

The author's conclusions are that, overall, the U-space Regulation provides a solid basis for establishing U-spaces across the EU to accommodate unmanned air traffic, but nevertheless remains incomplete and inconsistent in some points. From a general perspective, the author notes that the regulation is too asymmetrical in its approach, fearing to establish a comprehensive scheme that would explain all the new obligations of both ATPS and USSPs. Furthermore, the use of U-space for urban air mobility purposes will require further technical development and regulation. The author concludes by noting that much of the current work on U-space only begins with the adoption of the recent regulatory framework.

In Chapter 8, Annemarie Schuite, senior legal officer of the Dutch Safety Board, examines the problem of Accident and Incident Investigation from the perspective of unmanned aircraft, since it seems inevitable that more and more accidents will involve them, given the enormous growth in their uses and the wide range of sizes of these aircraft and the diversity of operations in which they can be used, including door-to-door package delivery functions and air taxi services for one or more passengers. The author then starts with the principles developed on the subject by the ICAO: 1) the risk of UA causing harm to people or damaging property on the ground; 2) the risk of collision between a UA and another airspace user at any stage of flight.

Annemarie Schuite lucidly points out that although unmanned flights go back a long way, legal regimes still need to be adapted to this rapidly growing phenomenon. In particular, the international regulatory framework for civil aviation seems irrelevant since most operations with UA are domestic. At present, therefore, it is up to individual states to determine the rules applicable to unmanned aircraft and UAS, including the investigation of accidents involving them.

According to the author, it is very likely that the authorities investigating accidents of manned aircraft are also the organisations designated to investigate accidents of unmanned aircraft. Therefore, it seems logical to apply uniform working methods to accidents involving both manned and unmanned aircraft, based on the principles of Annex 13 to the 1944 ICAO Convention. However, adaptations will be necessary to address the elements in which unmanned aircraft and their operations differ from manned aircraft and their operations. Finally, the author mentions the possibility of applying a kind of filter in order not to overburden accident investigation authorities with the obligation to investigate every single unmanned aircraft accident, in the sense that the investigation obligations for accidents caused by UA should be limited mainly to those with serious injuries or fatalities, or in any case to those deemed sufficiently relevant by the investigative body from a Just Culture perspective, i.e. to draw lessons for the improvement of safety.

Chapter 9, written by Yasmin Bhatti, a Belgian lawyer working for Amazon, opens the part of the book dealing with aviation security issues. Specifically, it deals with criminal liability, starting from the assumption that the very rapid growth of UAS technology also leads to growing concerns that this technology can be used by individuals or criminal organisations to conduct illegal activities, such as drug trafficking, terrorism, smuggling, and espionage. Indeed, the author points out that the use of UAS devices may be attractive to such types of criminality due to the fact that remote UAS operators are certainly much more difficult to catch. The same author, therefore, making an interesting excursus of the general principles of international criminal law through the analysis of the Conventions of criminal aviation law, such as the Montreal Convention of 1971 and the Beijing Convention of 2010, which apply to UAS, being the same to all intents and purposes considered aircraft. However, the author concludes that since UAS certainly represent a fairly new component in the aviation system, this should lead to some challenges when it comes to adapting the existing legal framework from a criminal law perspective.

Therefore, although some sort of criminal legal framework exists at an international level, it remains to be seen in practice whether it will actually be able to cover all acts and offences with or against UAS and whether the increase in the use of UAS, and thus the increased risk of criminal offences with UAS, will lead to the development of an international legal framework specifically designed for UAS. The author, therefore, argues that today the most important criminal legislation applicable to UAS can still be found at a national level, even if this leads to a dangerous fragmentation, which can lead to paradoxical situations in which the same act may constitute an offence in one country and not in another. Therefore, the challenge from a legal point of view would also be to ensure that all UAS users are aware of the applicable rules and sanctions.

Prof. Anna Masutti, Tenured Professor of Aerospace Law at the University of Bologna, and Filippo Tomasello, Aerospace Engineer for the Italian Air Force and then at the Italian Air Traffic Control Board and member of several ICAO bodies, are the authors of Chapter 10, which deals with security issues related to the increasing use of UAS in many civil activities. The authors summarise the main risks associated with the use of UAS, consisting of threats to public safety, the protection of privacy and personal data, and cybersecurity. They emphasise the necessary interdependence between safety and security, examining the provisions of Articles 4 and 88 of Regulation (EU) No 2018/1139. Then. they analyse Annex 17 to the Chicago Convention, on which the definition of 'security' as the activity of safeguarding civil aviation from unlawful interference is based, with the (non-exhaustive) list of acts or attempted acts that are to be considered as unlawful interference.

The authors next dwell on the role of U-space services for security, such as those represented by the electronic registration of unmanned aircraft and Geo-Awareness with its limitations, as well as the counter measures to UAS undertaken by EASA with the Counter Action Plan (C-UAS Action Plan), included in the latest edition of the European Plan for Aviation Safety 2021-2025. Also mentioned are the Counter UAS measures developed by the EUROCAE Working Group WG 115. Finally, no less important are the notations on the role and responsibilities of UAS operators in relation to security at the international level under Part IV of Annex 6 to the 1944 Chicago Convention and for the European level in accordance with Regulation (EU) No 2019/947 and its Annex.

Hence, the authors conclude, with a realistic observation that the most sensitive aspects of security have been addressed with an efficient regulatory and standardisation approach, both at an international and European level, even though the disruptive development of UAS technology will always require new efforts to implement a security strategy in this field that is not only reactive, but also proactive.

In Chapter 11, Dr Alan McKenna, lecturer in Law at the University of Kent in England, examines the nature of privacy issues that may arise from the use of unmanned aircraft, identifying the array of regulatory mechanisms that exist to deal with them, and using these factors to comprehensively analyse the matter of legal enforcement, which is a key issue when considering public acceptance of unmanned aircraft technology. After clarifying in the introduction the multifaceted nature of the concept of privacy and citing the results of two interesting studies conducted in relation to citizens' concerns about informational and spatial intrusions into privacy that occur due to the use of UAS technology, the author dwells on the legal enforcement framework present in the United Kingdom and Kenya where, in both cases, there is a regulatory framework that provides specific protection tools for privacy violations by unmanned aircraft. systems. When outlining legal remedies, however, the author clearly notes how the UK regulatory framework, for example, does not contain specific provisions to address 'the pressing issue of privacy' in the area of unmanned aircraft systems.

The author, therefore, notes, with precise evidence, that it is very difficult to ensure legal enforcement of the different types of privacy violations, since there is in fact no 'redress available, highlighting the potential conceptual width of what privacy might be considered to encompass'. In conclusion, therefore, he affirms the need for the creation of appropriate laws to deal with them and the guarantee that these laws can be appropriately enforced.

Chapter 12, written by Deepika Jeyakodi, offers a discussion on cybersecurity issues related to the use of UAS, which with their increasing presence are revolutionising the aviation landscape, but are also subject to one of the biggest problems arising from their integration into the airspace, namely fragility in the cybersecurity sphere. Indeed, cyberattacks are a global problem and the total dependence of UAS on digital components and communications, with little or no human interference, makes them very vulnerable to attacks that compromise their safety, security and efficiency.

UAS are basically flying computers and are, therefore, subject like any other computer to cyberattacks that include, among other things, hacking, jamming and spoofing. After an interesting exposition on the concept of cyber vulnerability and its manifestations for UAS, the author proceeds to a definition of the international regulatory framework for aviation cybersecurity. She then mentions Annex 17 to the Chicago Convention and its Chapter 4 specifically dedicated to cyber threats, as well as the work of the Aviation Security Panel (AVSEC) together with the Working Group on new Emerging Threats at the instigation of the ECAC, and international conventions on the subject, such as the Cybercrime Convention. Finally, she makes some valuable suggestions to mitigate the risks from cyberattacks on UAS, stating in closing how the only way to address these increasingly emerging risks is to find a global solution, as current laws (such as the ICAO Standards and Recommended Practices and national laws) do not fully accommodate cybersecurity elements.

Paul Kimon Weissenberg closes the security section with Chapter 13, which addresses the 'Case of military drones in the evolving European defence landscape'. In particular, the author delves into the institutional developments relevant to military drone technology, with a focus on Eurodrone and the role of institutions such as the European Commission and the European Defence Agency, as well as NATO, as this capability is intersected with recent policy developments such as the European Defence Fund and Permanent Structured Cooperation (PESCO). Indeed, in the author's expert view, the role of the European Union in seeking the promotion of a common approach to the development of armed drones, both from a political and a technical point of view, should not be underestimated.

Chapter 14 opens the section of the volume devoted to the area of private law regarding UAS. In particular, in this chapter Dries Deschuttere and Charlotte Thijssen discuss the 'Civil Liability Issues in International Transport'. They undertake a solid analysis of liability regimes that might apply to UAS. In particular, as concerns the contractual liability, they check the application of the Montreal Convention of 1999 to the transport of persons and cargo, and then discuss the con-

sumer protection and the third-party liability for damage to the ground, adding that the Rome Convention will not play an important role. Besides the fact that the 'operators' criterion' of the Rome Convention will be difficult to define with regards to UAS and that 'in flight collision' is not covered, the Convention cannot count on enough ratifications to be of importance. The authors believe copy/pasting international law used for civil purposes applying to UAS, to be insufficient. We are hence facing two options: (1) leave the application of a liability regime to national laws or (2) draft a new (preferable) international Convention that seems the most appropriate solution from a transparency, harmonisation and legal perspective. There certainly is, in fact, a need for an international regulatory framework governing third party liability and regulating situations of damage suffered by third parties on the ground and damage generated by in-flight collisions.

Chapter 15, written by Nicholas Medniuk, focuses on insurance policies covering the risk of loss or damage to a drone and third-party liability arising from the operations of these machines. The author initially outlines an interesting definitional framework in relation to the principles that govern the insurance contract and the obligations arising from it and then goes on to outline the specific characteristics of insurance contracts in the UAS sector. In particular, he starts with compulsory insurance within the framework and terms of Regulation (EC) 785/2004 applicable to all air carriers and all aircraft operators flying within the territory of a Member State to which the Regulation applies, and then makes some reflections in relation to underwriting. The insurance contract and the various types of policies are then mentioned, beginning from those tailored for UAS, going on to describe the Hull Cover that protects against the physical loss of a UAS and covers loss or damage to the vehicle, and then mentioning the third-party liability policy. Explanations of exclusions, conditions and warranties, geographical policy limits and a section on claims investigation and a paragraph on financial crime complete the picture. The author, therefore, provides a truly comprehensive overview of the subject and concludes by stating that the change brought about by unmanned aircraft technology is expanding so rapidly that a major overhaul of the risk profile covered by UAS policies will almost certainly be necessary, with UAS insurers likely to look to traditional aviation insurance for policy developments.

Prof. Daniel Patrick Hanley closes the section on private law with Chapter 16, focusing our attention on international aviation law and the financing of unmanned aircraft. He argues that it would be appropriate to examine the now well-developed law of international aircraft financing as it applies to drones, or at least to those that are capable of international commercial use and are large enough to require registration in the same way as aircraft, a topic that there has been little need to consider until now.

In this sense, the author starts from the international conventional framework, of which financiers should be aware, with the notion of aircraft contained in Chicago Convention and then refers to the Cape Town Convention of 2001, which is applicable to unmanned aircraft if they meet its minimum load requirements, being in that case, therefore, subject like other aircraft to its provisions on international interests.

If UAs do not meet the requirements of the 2001 Cape Town Convention, it is possible that the provisions of the 1948 Geneva Convention on the International Recognition of Rights in Respect of Aircraft might apply, since the Geneva Convention also refers to the definition of aircraft by the 1944 Chicago Convention, so that it would cover manned and unmanned aircraft alike.

The author then mentions the Rome Convention of 1933, which limits the precautionary arrest of aircraft in certain situations. In addition, he examines the legal issues related to the three main jurisdictions that lenders should take into account, i.e. the jurisdiction of the state of registration, the jurisdiction of the place of incorporation of borrower and the lex situs, i.e. where the unmanned aircraft is physically located at the time the security is pledged in favour of the financer to secure the repayment of the borrower's indebtedness.

Finally, the author dwells on the problematic enforcement of remedies on the other elements, beyond the aircraft itself, such as the control station and command and control links that are ground-based for remotely piloted aircraft. For now,

this is more of an academic concern than a practical one, but in the future, as the payload capacity and value of UA augments, it will become an increasingly real problem. Considering these future developments, the author puts forward some interesting suggestions that could be considered to provide answers to this problem.

The fifth part of the book is dedicated to stakeholder activities and begins with Chapter 17, written by Prof. Liu Hao, an expert in air and space law, who focuses on the Joint Authorities for Rule Making on Unmanned Systems (JARUS). He explains the nature of this expert group that brings together regulatory expertise from all around the world. Currently, sixty-three national aviation authorities, together with EASA and EUROCONTROL, are members of JARUS and contribute to the development of its products. The author effectively explains the vision and mission of JARUS: the first is to produce recommendations (which are however non-binding) on UAS including RPAS that meet the common needs of JARUS members, stakeholders, and the ICAO. The second is to develop technical standards and operational requirements for the safe, secure, and efficient operation of UAS. Each state or regional organisation (such as the EASA) will be able to decide how to use the harmonised provisions developed by JARUS as the basis for its own regulations.

The structure of JARUS, following the 2020 reform, now sees an updated formation with the maintenance of three working groups: Operation and Organisation, Airworthiness, Safety and Risk Management. It is also emphasised how JARUS benefits from the advice and expertise of the world's largest industries, organised in the Stakeholder Consultation Body.

Furthermore, the author brilliantly summarises the work done by JARUS in the completion of no less than 17 documents and the merit of having focused the attention of global UAS regulators on the divergence of UAS from manned aviation and the need for them to establish methods and criteria for design, construction and production and operational authorisations that are proportionate. Indeed, the merit of JARUS lies in having called for a flexible regulatory approach in relation to future developments required by the range of possible types, the operational environment and performance. This is the cornerstone of regulation following a risk-based approach. JARUS can, in fact, be attributed with the contribution to unmanned aviation made by the 'ABC' risk-based operational categorisation, *i.e.,* that based on categories A (Open), B (Specific), C (Certified).

In addition to interesting notes on the work carried out by the working groups within JARUS on Airworthiness, Operations, Organisation and Personal and Safety and Risk Management, the author also mentions the future work programme on UTM/U-space. All in a perspective of global coordination that facilitates the definition of common requirements and avoids duplication and fragmented approaches.

In Chapter 18, there is the signature of the book's editor-in-chief, Dr Benjamyn Scott, who addresses the crucial importance of the contribution made by major industry associations globally, for the acceleration of technological development in aviation, including UAS. These include the Airport Council International (ACI), the Civil Air Navigation Services Organization (CANSO), the International Air Transport Association (IATA) and the International Coordinating Council of Aerospace Industries Associations (ICCAIA), which advocate the interests of their respective industries. After sketching a concise but comprehensive outline of the functions of each of these international aviation stakeholder organisations, including, inter alia, that of influencing regulatory and rulemaking processes by proposing concrete technical, legal, social or economic problems with a pragmatic and cooperative approach, the author focuses on their activities in the area of unmanned aircraft systems. Finally, he mentions an important and fruitful example of cooperation at a European level among aviation stakeholder organisations, which have signed up to the 'We Are All One in the Sky' initiative that defines five key principles for a successful regulatory framework for UAS and U-space. Since these principles were not fully integrated into the EASA's proposal for a high-level regulatory framework for unmanned aviation operations and UAS traffic management (UTM/U-space), published in March 2020, it reaffirmed its commitment to further improve the proposed regulation.

In closing, the author cites the ICAO as an important framework for cooperation at a global level where industrial organisations enjoy observer status empowered to submit Working Papers to the General Assembly on a number of issues

relevant to the aviation sector. He also strongly stresses the importance of these organisations in making industrial needs evident to civil society as well in direct and transparent ways through press releases, statements, position papers and studies.

In chapter19 Dr Andrea Trimarchi, PhD graduate in Aviation Law from the University of Cologne in Germany, discusses industry standards that have become increasingly crucial in the drafting and adoption of laws and policies as well as in the harmonisation of technical regulations.

He thus provides a definition of standardisation in general as such a consensus-building process, involving numerous players and combining the market needs of industry with the regulatory objectives of public authorities in an attempt to identify and harmonise best practices. In Europe, for example, industry standards are an absolutely relevant resource for the adoption of technical standards and supporting material by the EASA. In this way, standards can also become part of the regulatory measures adopted by the EASA, in accordance with Article 76(3) of the EASA Basic Regulation (Regulation 2018/1139).

After having made an excursus on the regulatory framework underpinning the standardisation process in the European Union and represented by Regulation (EU) No 1025/2012, the author outlines the role of the ESOs as the competent bodies for the development and adoption of standards in Europe.

He then focuses on the need for standardisation in the UAS sector to ensure the steady, reliable development of the unmanned aircraft industry, emphasised by, among others, SESAR JU in 2016. The contributions of the International Aerospace Quality Group (IAQG) and the Aerospace and Defense Industries Association of Europe - Standardisation (ASD-STAN), also active on UAS standardisation, are then mentioned. In the latter case, the activity is carried out by a specific working group (D05/WG08), which develops standards for UAS in the areas of classification, design, manufacturing, operations, maintenance, and safety management, collaborating, ex multis, also with the European Commission, the EASA and key industrial stakeholders to provide UAS standards for 'CE marking'. The role of the European Organisation for Civil Aviation Equipment (EUROCAE) and the European UAS Standards Coordination Group (EUSCG) are also mentioned, as well as the Drone Airworthiness Project. With great thoroughness, the author also refers to the UAS standardisation processes in the United States, finally clarifying that even if standardisation per se is not a regulatory activity, it serves as an indispensable technical guide, as well as a forum for sharing, evaluating and updating best practices also in the UAS sector in order to avoid and prevent gaps and overlaps.

In Chapter 20, Rada Popova, General Counsel at ISAR Aerospace Technologies, deals with a highly fascinating and interesting topic for the future, not only for aviation, namely 'High-Altitude Activities' that have not yet been specifically regulated by law. In fact, although vehicles operating at high altitudes can be considered a category of unmanned aircraft with unique, special properties that serve precisely for operational scenarios at high altitudes, they are not included in the existing international and European regulatory framework for unmanned aircraft.

Rather, the author points out that the first steps that give legal certainty to high-altitude operations are gradually emerging but are very piecemeal, so they will certainly still need to be developed as technology advances further. Indeed, these activities are hot topics for both aviation and space technology. Therefore, the author in a clear, concise but comprehensive style outlines their main characteristics, the area in which they are carried out and their main applications. In addition, she provides an insight into the most relevant legal challenges in this field, thus identifying the main gaps in relation to future regulations.

The author concludes by stating that, in any case, civil aviation organisations such as the EASA and EUROCONTROL seem to have recognised high-altitude activities as falling within their area of responsibility. Some efforts have, in effect, been undertaken through the 'European concept for higher airspace operation (ECHO) SESAR 2020' project, led by EUROCONTROL with the participation of consortium partners such as Airbus ATM, the Italian Aerospace Research Centre, Dassault Aviation and others.

Closing, and worthily crowning, the section on stakeholders and the part of the volume regarding the general regulatory framework on UAS in the various branches of Safety, Security, Private Law and Stakeholders, all addressed under the prism of existing laws, is the important topic of Urban Air Mobility, presented in Chapter 21 by Konstantinos I. Andritsos and Dr Vasilis Agouridas. This theme presupposes, in fact, the preceding ones. The authors concisely and acutely highlight how a strong awareness of the complementarity and coexistence of mobility services enabled by UAS, such as Urban Air Mobility (UAM), is still being developed. At present, applications of UAS are rather limited and at a practically experimental level in the fields of agriculture, cartography, healthcare and the transport of goods and people, to name a few. One obvious reason is the absence or limited presence of advanced laws covering liability, insurance and licensing issues appropriate to the use of these aircraft and the services they provide. Due to this lack (or very limited provision) of these basic prerequisites, it is particularly difficult for UAS services to be incorporated into the everyday operations of society, unlike motor vehicles and associated services. Therefore, the authors emphasise the need for a holistic approach to UAS services, with a focus on basic mobility solutions, interface, and integration requirements with existing and future transport systems.

To this end, laws governing the behaviour of UAS, operators and safety measures are, among other things, undoubtedly mandatory elements for the success of these aircraft. However, an issue of primary importance is the promotion and creation of an integrated mobility ecosystem, capable of incorporating all available aerial and surface vehicles (both manned and unmanned) in an urban environment, for the purpose of a sustainable, inclusive, and integrated era of passenger and goods mobility.

After outlining the definitions and relationships between UTM-U-space and UAM, the role of the stakeholders involved and the regulatory authorities, the authors then carry out a lucid examination of the legal aspects of UAM, finally exposing some very relevant examples of UAS applications in the healthcare sector worldwide.

In closing, they express the very realistic belief that an efficient development and deployment of UAM services that address all necessary aspects (e.g. legal, environmental and infrastructural) of this emerging cross-sectoral UAM environment is a necessary condition for the creation of UAM services. It is indeed clear that UAS, eVTOLS and UTM are fundamental aspects of UAM. However, the UAM is much more than just an airspace for UAS and eVTOLs.

The book concludes with Part VI, consisting of 21 chapters, respectively dedicated to the national regulatory realities of no less than 21 different countries around the world, ranging from Europe to Asia, Africa and the United States.

The chapters on national laws all include a part on aviation and other laws specifically relevant to the use of UAS, a part on jurisprudence, a part on civil and state applications of UAS, and a final chapter containing conclusions with interesting insights into the national legislation of the country in question. This structure offers very interesting insights for academics, lawyers and legal professionals, national, regional and international regulators as well as students approaching the subject of UAS, proving to be a useful, versatile and very practicable tool.

In Chapter 42, Dr Benjamyn Scott, the Chief Editor, writes the ‘Concluding Remarks’. In the final analysis, he has produced an excellent book, with some truly outstanding chapters and a very comprehensive overview of the most relevant areas for the world of UAS, such as those of Safety, Security, Private Law and Stakeholders Activities, as well as a very complete overview of the regulatory state of the art on UAS in different countries around the world.

This volume, therefore, represents not only a testament to in-depth academic work, but also proves to be of great practical use and will hopefully contribute in its capacity as ‘an introduction to national, regional and international law relating to UAS’ to ‘provide a source for further discussions on the safe and secure use of UAS and allow regulators to continue with the appropriate regulation of UAS for the benefit of the world’, as Dr Scott elucidates in his concluding remarks.

La Just Culture Aeronautica nel Sistema Penale Italiano. Una Difficile Integrazione.

by Marco Di Giugno Marco and Michele Pilia[*]
book review by Anna Masutti[**]

The integration of the aeronautical Just Culture in Italian criminal law is currently a hot topic which has, once again, entered political and legal debates being closely connected to the protection of workers and working environment, as well as the so-called whistleblowing legislation. In fact, also due to the interventions of the European Union, regulatory/interpretative adjustments to the regulation of crime prevention models within organizations have been necessary. The volume *La Just Culture Aeronautica nel Sistema Penale Italiano. Una Difficile Integrazione*, by lawyers Marco Di Giugno[***] and Michele Pilia[****], is set in this vibrant context.

With this book, the Authors have set a series of ambitious goals, managing to achieve them as far as possible within the current regulatory framework. The volume aims at explaining complex concepts that could otherwise be considered evanescent, placing them concretely in the operational reality that characterizes the world of civil aviation. However, the same principle would also apply to other sectors of the legal system such as transport law *tout court*, occupational safety, risk management, and risk assessment of complex corporate structures.

Just Culture performs numerous tasks focused on the ultimate goal of identifying risks, preventing accidents and assuring the safety of citizens. Criminal law has the same objective – increasing people's safety – through three main types of reactions and answers: i) *general preventive* and *special preventive*, ii) sanctioning and iii) re-educational. Hence, what are the reasons behind a "*difficult integration*"? *Est modus in rebus*. The difficult integration correctly highlighted by the Authors lies in the method.

In fact, Just Culture addresses safety in a proactive way. It aims to create trust and collaboration among the operators who are on the front lines, providing information that may impact risk: following Just Culture principles, operators have the full awareness that it is necessary to adopt a systemic approach to human error, which is the result of multiple factors and conditioned by the working environment in which the operators are placed. Criminal law, on the other hand, has a repressive/sanctioning approach and tries to reach higher level of prevention following the traditional theories of criminal law (e.g. *general preventive* and *special preventive*).

This volume – divided into three distinct parts, which don't correspond exactly to the three macro chapters of the book – offers a systematic treatment of Just Culture, making it no longer an abstract concept, but a practical tool, defined through a multidisciplinary, scientific, systematic approach, not characterized by distorted and unrealistic visions of the human being (e.g., that of the so-called model agent, which never reflects real life, fallible, operator).

Above all, this book offers operational tools for *"First line operators"* and guidelines that are can be deemed useful for companies. In fact, the Authors devote a large part of the monography to underlining the value and importance of organizational models: safety management system, model of d.lgs. n. 231/2001 and policy factors which, according to the

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* La Just Culture Aeronautica nel Sistema Penale Italiano. Una Difficile Integrazione, Marco Di Giugno and Michele Pilia, CEDAM, Italy, 2022, ISBN: 9788813381134.

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Authors, are the real tools that allow a correct dissemination of Just Culture and a culture of safety in the aeronautical world, but which can easily be extended to other sectors.

Lastly, it needs to be highlighted that the Authors have not remained in the world of pure doctrine, but used concrete methodology offering ideas for managing the points of contact between issue of safety and criminal law, even adopting currently insufficient legislative instruments. They are able to do so thanks to their profound knowledge and competence, deriving from direct experience and understanding of the problems and complexities of the aeronautical sector. In this way, the readers, even non-expert ones, are given a valid key to understand this multifaceted reality. Therefore, this volume represents a useful compendium for those who want to approach the topic in a broader way.

Events

15th European Space Conference, Securing the Future of Europe in Space
Brussels, 24-25 January 2023

European Air Law Association (EALA) 13th Liability Seminar
Berlin, 3 February 2023

13th McGill University and PEOPIL Annual Conference, International Aviation: Liability, Insurance & Finance
Paris, 21-22 April 2023

ICUAS Association, International Conference on Unmanned Aircraft Systems
Warsaw, 6-9 June 2023

Worldwide Airport Lawyers Association (WALA) Annual Conference
Paris, 28-30 June 2023

15th European Space Conference
Securing the Future of Europe in Space

Brussels,
24-25 January 2023

On 24-25 January 2023, the European space domain have gathered in Brussels for the 15th European Space Conference.

The yearly high-level meeting of the key stakeholders of the European space domain returned to Egmont Palace in Brussels for two days of dynamic and thought-provoking debates and exchanges, focusing on the theme "*Securing the Future of Europe in Space*".

Like the previous annual editions of this cycle of conferences dedicated to the European Space Policy and its technological and industrial challenges, the 2023 conference have brought together, on site and online, high-level decision makers from across the EU institutions and Member States, the European Space Agency (ESA), high-level representatives of the industry, civil society and researchers, resulting in two days of information sharing and rich debates throughout the various sessions, while leaving room for informal meetings and high-level networking.

Debates have covered key topics:

1. **Secure Connectivity**
2. **Defence and Security**
3. **Space Exploration**
4. **International Cooperation**
5. **Space Applications**
6. **Space Entrepreneurship**
7. **Space and the Green Deal**

Detailed information about invited speakers and the programme is available HERE.

European Air Law Association (EALA)
13th Liability Seminar Liability, insurance, passenger rights, litigation and litigation financing in the air transport industry

Berlin,
3 February 2023

Ever since the series of Munich Liability Seminars was started by EALA in 1997, liability developments and claims handling in the air transport and aerospace industries were the focus of these conferences, presented and discussed by leading experts and prominent moderators.

This year the Liability Seminar has been held at the new Berlin Brandenburg Airport (BER). The venue for the conference was the Steigenberger Airport Hotel Berlin, a few steps away from the gates at the Berlin Airport.

The 13th Liability Seminar covered a wide range of topical issues:

- Regulation 261/2004: This panel will provide an update on the efforts to amend the Regulation, litigation involving Reg. 261/2004 and the issue of whether the Regulation applies to business a/c charter operators.
- A presentation will discuss the online enforcement of passenger rights concerning unused fees and taxes in case of voluntary cancellations of flights by passengers
- The liability exposure of aircraft lessors will be examined.
- An innovative approach to litigation financing will be the topic of a presentation discussing the opportunities for potential plaintiffs to find providers of funding through an online platform.
- One panel will deal with operational challenges for airports, airlines and their cockpit crews both during and after the pandemic and the resulting liability exposure and litigation.
- The current status of civil aviation in the Ukraine will be discussed by a Ukrainian expert.
- Insurance claims by a/c lessors resulting from leased aircraft having been stranded in Russia as a consequence of the sanctions imposed on Russia and Russian law allowing the re-registration of these a/c in Russia will be the focus of another session.
- To enable the Courts to continue operating during the pandemic, there was an increased use of video conferencing facilities ('VCF') to allow parties to attend proceedings remotely. These developments that may continue in the future will be analysed by one panel.
- The final panel concluding the 13th Liability Seminar will address li- ability and claims handling developments that are of particularly great significance for the aviation industry.

Detailed information about invited speakers and the programme is available HERE.

13th McGill University and PEOPIL Annual Conference International Aviation: Liability, Insurance & Finance

Paris,
21-22 April 2023

The McGill University and PEOPIL have announced their 13th Annual Conference on ***International Aviation: Liability, Insurance & Finance***, that will be held in Paris on 21-22 April 2023.

This event will bring together world-leading aviation liability, insurance and finance experts to address, ***inter alia***, the following topics:

- Recent Developments in Aviation Liability
- Air Carrier Passenger Liability and Comparative Jurisprudence Under the Warsaw System and the Montreal Convention of 1999
- Products Liability of Manufacturers of Aircraft, Engines and Component Parts
- Liability of Airports and ANSPs
- Air Cargo Liability
- Governmental Liability for Aviation Accidents and Acts of Terrorism
- Litigation Strategy: Procedural Tools
- Damages: Economic and Non-Economic
- Consumer Protection Regulation and Litigation
- Aircraft Leasing and Finance
- The Challenges of Settlement and Emerging Insurance Issues
- The Impact of Communicable Diseases on the Airline and Hospitality Industries
- Drones- Safety, Security and Liability
- French Language Breakout Session on Contemporary Issues in EU Law

The conference will host two events to facilitate networking among attorneys, insurers, air carriers, manufacturers and government representatives.

Detailed information about invited speakers and the programme is available HERE.

ICUAS Association
International Conference on Unmanned Aircraft Systems 2023 (ICUAS 2023)

Warsaw,
6-9 June 2023

The 2023 International Conference on Unmanned Aircraft Systems (ICUAS 2023), is organised for the first time on a university campus. It will will be held on 6-9 June 2023, in Warsaw at Lazarski University.

The ICUAS 2023 offers unique opportunities to meet, interact and shape the future of unmanned aviation worldwide, bringing together the technical, regulatory, and legal communities.

The central theme of ICUAS 2023 is threefold:

1. reconfigurable aerial platforms;
2. multi-purpose/hybrid aerial platforms;
3. regulations and standards for autonomy.

National and international organisations, agencies, industry, and authorities work towards defining roadmaps of Unmanned Aircraft Systems/Remotely Piloted Aircraft Systems (UAS/RPAS) expectations, technical requirements and standards, that are prerequisites to their full utilisation and integration into the national airspace. The next generation of UAS/RPAS will be used for a wide spectrum of civilian and public domain applications.

ICUAS 2023 aims to bring together different groups of qualified representatives worldwide, funding agencies, industry, academia, end-users and practitioners to discuss the current state of unmanned aviation, and the roadmap to their full utilisation in civilian and public domains. Special emphasis will be given to research opportunities, and to "***what comes next***" in terms of the tools, essential and support technologies, law and standards, which need to be utilised and implemented to advance the state-of-the-art nature of UAS.

Detailed information about invited speakers and the programme is available HERE.

Worldwide Airport Lawyers Association (WALA) Annual Conference

Paris,
28-30 June 2023

The 13th edition of the Worldwide Airport Lawyers Association (WALA) annual conference will be taking place in Paris, on June 28-30, 2023. The Conference will be followed, on the afternoon of 30 June, by the inaugural Urban Air Mobility Forum which will take place at the same venue and host panel discussions on the current state of the urban air mobility industry and the legislative regimes required in order to make urban air mobility a safe, accessible and legally compliant mode of transport.

The Conference is being held in partnership with ADP Groupe, which will host this event at their premises next to Terminal 3, Charles de Gaulle Airport. The Conference will include a visit to Charles de Gaulle's main airside facilities, a pre event seminar, and the usual worldwide agenda.

If you have any questions, wish to suggest a topic or be a speaker, or advertise, please contact WALA directly at wala@abiaxair.com.

For more information and registration please visit: https://www.abiaxair.com/wala2023/registration.php#

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