# Forging New Space Law to Support Innovation and Sustainability of Space Resources: Preview of the 2023 World Radiocommunication Conference

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**Abstract**

The blistering pace of innovation in space, including the unprecedented growth of the population of Low Earth Orbiting satellites continues to advance unabated. Accompanying this new space boom are increasingly urgent calls for governance of this regime, or at least norms, guidelines, or standards to ensure safety, security, and sustainability of space for the benefit of all. Since 1959, the International Telecommunication Union (ITU), has been continuously developing new treaty law provisions to address the sustainability of spectrum and orbital resources while enabling new space services. The ITU's Radio Regulations are updated every four years by the World Radiocommunication Conference (WRC) to accommodate new services and technologies. The ITU will convene the next WRC in 2023 in the United Arab Emirates. This paper will inform how the ITU continuously updates space law to accommodate emerging space services while preserving sustainability of shared resources in the specific context of the challenging agenda of WRC-23.

## 1. Introduction

The blistering pace of innovation in space, including the unprecedented growth of the population of satellites in Low Earth Orbit (LEO) continues to advance unabated with ongoing announcements of new projects–some of even greater magnitude.[1] Accompanying this new space boom are increasingly urgent calls for governance of the space regime – through,

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1 J. Foust, Satellite operators criticize "extreme" megaconstellation filings, Space News, (14 Dec. 2021) https://spacenews.com/satellite-operators-criticize-extreme-megaconstellation-filings/.

norms, guidelines, standards, or national regulations – to ensure the safety, security, and sustainability of space for the benefit of all.

Space, the province of all humankind, is beyond the jurisdiction of any single country – or possession by a non-state entity. The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty) of 1967 set the fundamental framework for the governance of our use of space that continues to apply to this century's accelerating space endeavours. Along with the accompanying United Nations (UN) treaties of that bygone era, this legal framework has continued to guide us well for more than half a century. However, it is increasingly evident that the emerging and multidimensional challenges before us now require new and supplementary approaches and solutions to ensure the continued sustainability of the space environment.[2] To that end, there have been concerted efforts and much progress, including the development of the Long-Term Space Sustainability Guidelines by the UN Committee on Peaceful Uses of Outer Space (COPUOS) and other regional and national approaches for addressing the challenges before us.[3] Although some have observed that there has been no space treaty law developed to address these challenges of this modern age, this is not entirely the case, at least not in terms of radiofrequency spectrum and orbital resources that make possible these new space services. One UN body, the International Telecommunication Union (ITU), is regularly creating space law as part of its mandate to enable new telecommunications services to all the world's inhabitants, including managing the shared natural shared resources of spectrum and orbits that are foundational to these services.

Since 1959, the ITU, a specialized agency of the UN headquartered in Geneva, Switzerland, has been continuously developing new treaty law provisions and other regulatory mechanisms to promote and maintain the sustainability of spectrum and orbital resources while enabling provision of new services from space. The ITU's Radio Regulations, a treaty-level document containing detailed provisions to ensure the efficient and equitable use of the spectrum and orbital resources, and to prevent harmful interference, is updated approximately every four years by its World Radiocommunication Conference (WRC). Thus, the Radio Regulations are continuously amended and updated to accommodate new services and technologies; ensure avoidance of harmful interference to incumbent operations; and facilitate the efficient and effective use of shared resources so

2 United Nations, International Space Law: United Nations Instruments, United Nations, Vienna (2017) https://www.unoosa.org/res/oosadoc/data/documents/2017/stspace/stspace61rev_2_0_html/V1605998-ENGLISH.pdf.

3 A/AC.105/2018/CRP.20, Guidelines for the Long-term Sustainability of Outer Space Activities (27 June 2018) https://www.unoosa.org/res/oosadoc/data/documents/2018/aac_1052018crp/aac_1052018crp_20_0_html/AC105_2018_CRP20E.pdf.

to enable equitable access and extension of new services to benefit humankind. Following each WRC, Member States incorporate these decisions into their domestic telecommunication regulations.[4] The ITU will convene the next WRC from 20 November to 15 December 2023 at the Dubai World Trade Centre in Dubai, United Arab Emirates.[5]

WRC-23 will have a pre-set agenda, based on the draft agenda agreed by the previous Conference in 2019 and later approved by Council, the ITU body that manages the ITU's budget and operations. The WRC-23 Agenda includes not only spectrum allocations and regulatory solutions for advanced mobile communications (such as Fifth Generation (5G)), maritime, aeronautical, Wi-Fi, and other terrestrial services and applications, but also a broad array of traditional and new satellite and other space services. WRC-23 will continue the work of WRC-19 in developing new regulations to effectively manage large new non-geostationary satellite (non-GSO) system filings; to enable these new non-GSO systems to provide broadband communications to aircraft and ships; to expand provision for space-to-space links to allow connectivity between different orbital regimes; to provide regulatory status to facilitate operation of space weather sensors and sub-orbital vehicles – to name just a few examples.[6] Another major task of WRC-23 will be to agree on a draft agenda for the next WRC, expected to take place in 2027, and a preliminary agenda for the following WRC, likely in 2031. This paper will inform the reader how the ITU continuously updates space law to enable and accommodate emerging space services while preserving the sustainability of shared resources in the context of the challenging agenda of WRC-23.

## 2. Evolving Space Law: The ITU and the Radio Regulations

The ITU is a unique body in the UN system. For one thing, it is a freestanding intergovernmental organization with its own mandate and governing structure that far predates the UN itself. The ITU was founded in 1865, initially as the International Telegraph Union, to facilitate the interconnection of early telegraph systems across national borders. As radio waves began to be harnessed for telecommunications services, the need for

4 A.L. Allison, New Space Law Created to Enable Space Innovation While Preserving the RF Environment in Space; Notable Outcomes of the ITU's 2019 World Radio Conference, IAC-20-E7-7.9, 71st International Astronautical Congress, CyberSpace Edition (17-20, October 2020) (hereinafter Allison, WRC-19 New Space Law).

5 ITU Press Release: UAE to host next year's World Radiocommunication Conference (WRC-23) in Dubai (12 July 2022) https://www.itu.int/en/mediacentre/Pages/2022-06-29-WRC23-Host-City.aspx.

6 ITU Council Resolution 1399, Agenda of the 2023 World Radiocommunication Conference (WRC-23) https://www.itu.int/wrc-23/wp-content/uploads/sites/12/2021/12/RESOLUTION-1399.pdf (hereinafter WRC-23 Agenda).

international regulation soon followed, both to protect radio stations from harmful interference caused by other nation's radio operations and to impose operational standards for safety communications, a need which came to the fore with the growing reliance on maritime communications and incidents such as the sinking of the *RMS Titanic*. In 1932, the ITU broadened its mandate to formally add radiocommunications (along with broadcasting, and telephony) into its formal structure, and updated its name correspondingly to the International Telecommunication Union. The ITU joined the UN in 1947 as a specialized agency.[7]

The ITU features nearly universal membership of 193 Member States, the same number of Member States as the UN. Although each Member State is equal, with one vote, most decisions by ITU Conferences (except for elections) are taken by consensus. Another unique feature is the active participation of private sector and other non-state actors in the Union's work. These so-called Sector Members, among other categories of participants, include radio system manufacturers and operators (terrestrial and space), research institutions, trade associations, academia, and other international organizations and pay an annual fee for their participation.[8] Although these 900-some Sector Members and other participants cannot vote or participate in decision making at conferences of the ITU, they may take an active role in the working levels of the ITU and submit contributions, chair groups, and participate in decision making at the technical working level. This hands-on, direct involvement by the actual innovators, inventors, and experts on telecommunications (and space) technologies and services helps to continuously drive the relevance of the ITU's work statement and propel the currency and speed of its ongoing endeavours.

The Constitution of the ITU is a treaty instrument that establishes the Union's mandate, purposes, and structure. Among the ITU's fundamental tenets is the avoidance of harmful interference between the duly authorized radio stations of different states (Article 45) and the efficient use of (and equitable access to) radiofrequencies and orbital resources in the geostationary satellite orbit and other orbits (Article 44).[9] In addition to the Constitution, and its accompanying Convention, the ITU has a third basic instrument of treaty status, the Administrative Regulations, which includes the Radiocommunication Regulations.

7 A.L. Allison, The ITU and Managing Satellite Orbital and Spectrum Resources in the 21st Century, Springer, Cham, 2014.

8 International Telecommunication Union. Radio Regulations, ITU, Geneva (2020) https://www.itu.int/pub/R-REG-RR/en (hereinafter Radio Regulations).

9 International Telecommunication Union, Collection of the Basic Texts of the International Telecommunication Union Adopted by the Plenipotentiary Conference, ITU, Geneva (2019) https://www.itu.int/pub/S-CONF-PLEN-2019.

The Radio Regulations implement the Constitution's above-noted principles by providing detailed underpinnings for the implementation of the global framework for spectrum and orbit use, including protecting services from harmful interference and promoting efficient use of these resources to enable maximum service and equitable access to these shared resources. The principle of sustainability is reflected throughout the Radio Regulations. For example, No. 4.1 provides that:

> "*Member States shall endeavour to limit the number and frequencies and the spectrum used to the minimum essential to provide in a satisfactory manner the necessary services. To that end they shall endeavour to apply the latest technical advances as soon as possible.*[10]"

The Radio Regulations are adopted and amended at World Radiocommunication Conferences convened by the ITU. WRCs are treatymaking Conferences. Following every WRC, a new edition of the Radio Regulations is published incorporating the new and amended provisions. The most recent edition of the Radio Regulations was published in September 2020 to incorporate the revisions adopted by WRC-19. The revised Radio Regulations entered into force on 1 January 2021 – the 37th time the Radio Regulations have been updated in their 116-year history.[11]

The Radio Regulations include the Table of Frequency Allocations which indicates which radio services (or radioastronomy) may be operated in specific frequency bands subject to the specified conditions. Within its more than 2,000 pages, the Radio Regulations also provide definitions, technical, operational, and regulatory sharing rules, plans, regulatory provisions for coordination of terrestrial and space radio services, and provisions on treatment of cases of interference. The provisions provide a means by which Administrations may obtain international recognition of their operators' radio assignments (and thus protection from harmful interference by other nations' radio operations) derived from their recording in the Master International Frequency Register by the ITU's Radiocommunication Bureau.[12] Although this international regulatory status is important for all communications systems, it is of particular importance for satellites and other space systems whose stations are designed for long-term missions operating at very distant locations.

### 3. World Radiocommunication Conferences

World Radio Conferences are regularly convened every four years in an effort to keep pace with rapid pace of technological change. WRCs address items

10 No. 4.1, Radio Regulations.

11 International Telecommunication Union, Final Acts of the World Radiocommunication Conference 2019, ITU, Geneva (2019) https://www.itu.int/pub/R-ACT-WRC.14-2019/en (WRC-19 Final Acts).

12 Arts. 8, 9, 11, Radio Regulations.

on an agenda recommended by the previous WRC and approved by ITU Council. Having a pre-defined agenda affords a multi-year preparatory period and a detailed blueprint of each agenda item so that Member States and Sector Members may conduct technical studies and develop regulatory solutions for each agenda item; to develop proposals (limited to Member States); and to build consensus on regulatory solutions. If there is no satisfactory solution to an agenda item (such as when studies show that a proposed new service would cause harmful interference to incumbent services), the resulting solution and proposal may be for "No Change" to the Radio Regulations.[13] Because of the large number and increasing complexity of WRC agendas and agenda items; the growing level of competition among different radio services for access to limited resources; and the rapid rise of new technologies and services, the preparatory work tends to fill the full four-years of the preparatory cycle. An attempt in the 1990s and early 2000s to increase the pace of WRCs by convening them every two years proved to be unmanageable and too expensive.

Adding to the challenge, the ITU's modern tradition is for all WRC decisions to be agreed by consensus, rather than by voting by Member States. Achieving such global consensus increases the level of difficulty in resolving the agenda items, but results in more durable international agreements leading to a better spectrum environment for incumbent services and new services in fulfilment of the ITU's goals. WRCs, like all ITU Conference, are held in the six languages of the UN (although English is the informal working language). At their conclusion, WRCs adopt Final Acts which contain amendments to the Radio Regulations, along with Resolutions, Recommendations, and Declarations.[14]

The duration of the WRC is four weeks and typically includes evening, weekend, and inevitably, around-the-clock sessions necessary to achieve consensus – literally "consensus by exhaustion" – on all its agenda items. One of the most challenging agenda items of recent WRCs has been on agreeing on resolutions containing draft agendas for the next two WRCs as the competition for space on the agenda is strong and the number of complex issues that can be adequately addressed within the available timeframe is realistically limited.

For WRC delegates, the WRC is a marathon, not a sprint. The four-week WRC is preceded by a one-week Radiocommunication Assembly, which finalizes any of the technical recommendations developed by the Study Groups in preparation for the WRC that remain for approval (*i.e.,* the most

13 See *e.g.,* Director, Radiocommunication Bureau, Draft CPM Report on technical, operational and regulatory/procedural matters to be considered by the 2023 World Radiocommunication Conference (2023) http://www.itu.int/md/R19-CPM23.2-C-0001/en (hereinafter Draft CPM Report).

14 See, *e.g.,* WRC-19 Final Acts.

controversial or technically complex ones). Each WRC is immediately followed by a two-day Conference Preparatory Meeting (CPM) to organize the preparations for the next WRC based on the draft future conference agendas just adopted.

The most recent WRC, WRC-19, was held from 28 October to 22 November 2019 in Sharm el-Sheikh, Egypt. It was it the largest WRC in history with 3,420 delegates and 163 Member States in attendance, attesting to the growing importance of telecommunications services, including access to space resources, to most countries. WRC-19's agenda included 35 items covering a wide range of terrestrial and space-based services, in addition to proposing draft agendas for WRC-23 and WRC-27. Although the marquee topic of WRC-19 was 5G, satellite and space agenda items proved to be major topics, including issues related to the rapid growth of non-GSO satellite filings and proposed new space-based services. Indeed, WRC-19 was unable to complete its preparation of the Preliminary Agenda for WRC-27 as can be seen from the square brackets around elements of some of the agenda items.[15]

At WRC-19's conclusion, the Heads of Delegation signed Final Acts comprising 550 pages, including amendments to the Radio Regulations and proposed agendas for future conferences. The Final Acts included a new regulatory approach for managing large non-GSO system filings (including for those popularly known as "megaconstellations"); encouraging efficient use of spectrum and orbital resources by the next generation of non-GSO satellite systems; and streamlining regulations for small satellites for short duration missions (*i.e.,* CubeSats). These actions may appear to be routine ITU accomplishments, but they are nevertheless notable as they are new space law responsive to facilitating and accommodating new space developments – almost in real time.[16] Moreover, with its adoption of a recommended agenda for WRC-23 to address additional space issues that are arising, such as enabling services between satellites in different orbits and consideration of a regulatory approach to facilitate introduction of sub-orbital vehicles; one can see how the way to new space law is continuously being paved to accommodate the ongoing (and rapidly developing) new space technologies and services requiring access to shared resources.

Preparations for WRC-23, based on the proposed agenda recommended by WRC-19, have been underway since the first CPM in November 2019, Although the preparatory cycle was effectively reduced due to shortened virtual meetings throughout the height of the COVID pandemic, it did continue. In person preparations resumed in early 2022 in recognition of the vital need for progress on the vital technical studies to prepare for the radio conference.

15 See Resolution 812 (WRC-19), Radio Regulations.

16 WRC-19 Final Acts.

## 4. WRC-23

The agenda for WRC-23 includes several space-related items that reflect the ongoing advancement of technology and services, and the need for regulatory changes to facilitate their implementation. A sample of key space agenda items follows.

### 4.1. Management of Large Non-Geostationary Satellite Systems (Agenda Item 7)

WRC-19 addressed the regulatory challenges affecting the ITU, Member States, and Sector Members in managing the frequency assignments for the growing number of large non-GSO constellations. WRC-19 adopted an entirely new regulatory mechanism to ensure due diligence in the implementation of these systems; the integrity of the Master Register; and ultimately, the sustainability of the spectrum and orbit resource.[17]

Under the existing Radio Regulations, all geostationary satellite networks are subject to a seven-year time period to bring their assignments into use, or else face the cancellation of their filing (and loss of their regulatory status). However, the Radio Regulations lacked any definition of the regulatory period for non-GSO systems. In the meantime, the ITU's Radiocommunication Bureau provisionally applied a seven-year requirement through a Rule of Procedure.

WRC-19 considered various approaches to the issue of due diligence for the growing number of large non-GSO systems. It ultimately decided that while seven years was realistically too short a timeframe to implement a large non-GSO system in its entirety, a regulatory deadline was nevertheless needed to ensure that the system was built out in good time and that the reserved resources were being utilized as indicated. WRC-19 decided to adopt an entirely new two-prong approach. First, it adopted a new Radio Regulation, No. 11.44C, to define the bringing into use deadline for all non-GSO systems requiring that only a single satellite (with the capability of transmitting or receiving that frequency assignment has been deployed and maintained in one of the notified orbital planes).

Table 1: Non-GSO System Milestones adopted by WRC-19

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|---|---|---|
| 1st Milestone | 7 + 2 years | 10% |
| 2nd Milestone | 7 + 5 years | 50% |
| 3rd Milestone | 7 + 7 years | 100% |

The second prong, which applies only to large non-GSO systems in the services and allocations supporting large non-GSO communications systems (and thus not applicable to non-GSO systems performing sensing, scientific,

17 Resolution 35, Radio Regulations.

navigation, or other non-communication services) is a series of three performance milestones that apply after the seven-year bringing-into-use period. These milestones, shown in Table 1, require that a percentage of the system must be in use by additional the time period for that milestone. The Radiocommunication Bureau will reduce the assignments of any system which fails to meet a milestone which will be reflected in the Master Register. Moreover, to provide transparency of milestone completions, the notifying administrations of these non-GSO systems are required to provide to the Radiocommunication Bureau deployment information including satellite system information, launch information and space station characteristics. The deployment information is then to be published on the ITU's website and in its regulatory publications.

Although WRC-19 made substantial progress on the new regulatory approach to managing the resources devoted to large non-GSO systems, it ran out of time before it was able to fully develop all of the details required to fully implement this new approach. For example, further work is needed to develop post-milestone oversight of non-GSO systems subject to the procedures, coordination of these systems, and tolerances for orbital characteristics of these filings. WRC-23 will consider these missing elements and review how the procedure is working, including its initial retroactive application to some earlier non-GSO filings. The WRC's regular cadence allows for such an incremental approach to making changes to space law.[18]

Recently, a number of notifying administrations of both geostationary networks and non-GSO systems have been requesting extensions of the seven-year regulatory period due to delays related to the unprecedented COVID pandemic, which impacted manufacturing, launches, and the availability of satellite components.[19] The fallout from the recent Russia action in Ukraine has further contributed to delays.[20] One notifying administration of non-GSO systems subject to the milestone rules recently submitted a request to the ITU's Radio Regulations Board seeking a one-year extension of the milestones for *all* non-GSO systems due to these unique and unprecedented challenges.[21] The Board deferred this request to WRC-23.

18 Allison, WRC-19 New Space Law.

19 ITU Radio Regulations Board, Summary of Decisions of the 90th Meeting of the Radio Regulations Board (4 July 2022) https://www.itu.int/dms_pub/itu-r/md/22/rrb22.2/c/R22-RRB22.2-C-0015!!MSW-E.docx.

20 J. Rainbow, Seeking Regulatory Mercy: The case for extending constellation deployment deadlines, Space News (17 August 2022) https://spacenews.com/seeking-regulatory-mercy-the-case-for-extending-constellation-deployment-deadlines/.

21 Director, Radiocommunication Bureau, Submission by the Administration of Liechtenstein Requesting a One-Year Extension of Resolution 35 (WRC-19) Milestones for all Satellite Network Filings Subject to this Resolution, Document RRB22-11/11, (6 June 2022).

### 4.2. Mobile Connectivity for Non-Geostationary Satellite Systems (Agenda Item 1.16)

Large non-GSO system operators, such as Starlink, OneWeb, and Kuiper, plan to provide broadband connectivity to aircraft and ships, which the ITU refers to as "Earth Stations in Motion" (ESIMs). These systems are proposed to operate in the Fixed-Satellite Service (FSS), which is defined as service to earth stations in fixed or stationary positions. Service to mobile earth stations is traditionally the province of the Mobile-Satellite Service (which includes operators such as Inmarsat and Iridium). This subject of utilizing satellites operating in the FSS for provision of services to mobile platforms has been the subject of many WRCs since the 1990s (beginning with "Earth Stations on Vessels"). This is an example of where the definitions of the various radio services provided in Article 1 of the Radio Regulations have not kept pace with the development of technology (such as new antenna technologies), services, and consumer demand. Instead of re-writing the clunky definitions, which is very difficult as that would require substantial consequential revisions throughout the Radio Regulations, including the Table of Frequency Allocations, the ITU's practice has been to incrementally adjust the Radio Regulations to legitimize these operations on basically a band-by-band basis through resolutions and footnotes to the Table, but only after it has been technically established to everyone's satisfaction that the operation will not cause harmful interference to or otherwise constrain the operations of other primary services operating in those allocations.

Thus, recent WRCs have substantially approved the Ku and Ka FSS bands for ESIM operations by geostationary operators. Now WRC-23 will consider allowing non-GSO FSS operators in certain Ka-Band allocations to provide ESIM services. The preparations involve technical studies of protecting terrestrial stations from harmful interference and developing operational measures and coordination requirements to enable these operations while avoiding of harmful interference to other services with rights to the spectrum.

There was a desire to include in the WRC-23 agenda item for ESIM operations for FSS allocations for geostationary operators in the higher frequency ranges above 37.5 GHz (the V-Band). However, WRC-19 decided that the WRC-23 agenda (and the studies before Study Group 4) was already too full and relegated that item (and several others) to the draft preliminary agenda for WRC-27. WRC-23 will decide whether to maintain it and other items for the draft agenda it will adopt for WRC-27.

### 4.3. Extending Inter-Satellite Links including between Orbital Regimes (Agenda Item 1.17)

Now that non-GSO constellations are actively being launched and brought into service in LEO and medium Earth orbit (MEO), governments and commercial operators alike are finally realizing the extraordinary potential of multi-orbital regimes, where satellites in other orbits can be nodes within a

network to extend coverage and enable continuous continuity. One example of a proponent for a multi-orbital network is the US space agency NASA, which is seeking commercial alternatives to replace its aging Tracking and Data Relay Satellite (TDRS) constellation that serves as the backbone for near-Earth communications to space craft, including the International Space Station.[22]

Although the Radio Regulations currently provide for inter-satellite links, they only contemplate links within the same orbit. FSS allocations are accompanied by direction indicators: either earth-to-space or space-to-earth. Moreover, the sharing scenarios with other co-primary and adjacent services are complicated in the frequency bands at issue. In light of the complexity and the shortened study cycle, the necessary studies on this agenda item are not yet complete.[23]

### 4.4. Other Space-Related Agenda Items of WRC-23

The WRC-23 agenda contains several additional agenda items pertaining to space services, including:

- Regulatory provisions to facilitate radiocommunications of sub-orbital vehicles (1.6)
- Regulatory provisions to enable FSS networks by control and non-payload communication of unmanned aircraft systems (1.8)
- New secondary allocation to the Earth-exploration-satellite (active) service for spaceborne radar sounders (1.12)
- An upgraded allocation for the space research service (1.13)
- Possible allocation changes for the Earth-exploration-satellite (passive) service to ensure alignment with more up-to-date remote sensing observation requirements (1.14)
- Geostationary ESIMS in the Ku band (1.15)
- Spectrum for narrowband MSS systems (1.18)
- New allocation for FSS in Region 2 (Americas) (1.19)
- Possible changes on advance publications, coordination, notification and recording procedures for satellite networks to facilitate the rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit (7A-L); and
- Recognition in the Radio Regulations for space weather sensors (9.1A).[24]

22 M. Holmes, SES Partners with Planet for NASA Relay Network Contract, Satellite Today (10 May 2022) https://www.satellitetoday.com/government-military/2022/05/10/ses-partners-with-planet-for-nasa-relay-network-contract/.

23 See Draft CPM Report, pp. 580-675.

24 See WRC-23 Agenda.

### 4.5. Preliminary Agenda Items for Future Conferences

Another of the major challenges facing WRC-23 will be its adoption of the proposed agenda for the next WRC. In addition to the carried over topics that WRC-19 placed on the draft Preliminary Agenda for WRC-27, WRC-23 will consider new items for the following WRC. Among the items being talked about in the preparatory process are new Radio Regulations to support new In-Space, Assembly, and Manufacturing (ISAM) space services, including on-orbit servicing and proximity operations, and new frequency allocations for cislunar and operations. Another area of apparent interest is development of the E-Band (71-76 GHz and 891-86 GHz) – the next frontier for commercial FSS services. The upcoming deliberations at WRC-23 on this item will be a fascinating preview of Administrations' space priorities for the years ahead.

## 5. Conclusion

The ITU, through its quadrennial World Radiocommunication Conferences, is a reliable and effective inter-governmental institution that, in partnership with private sector experts, is facilitating innovation and the introduction of new space systems and space-based services to serve the planet, while making extensive efforts to balance the implementation of the these new systems with the need for sustainability of the limited spectrum and orbital resources that it manages for the benefit of mankind. The ITU effectively creates relevant space law multiple times each decade as technology advances and provides a proven model for future efforts to forge global consensus to promote and manage space activities for the benefit of all. WRC-23 will be the next step in its long journey of enabling the use of shared spectrum and orbital resources by all nations.