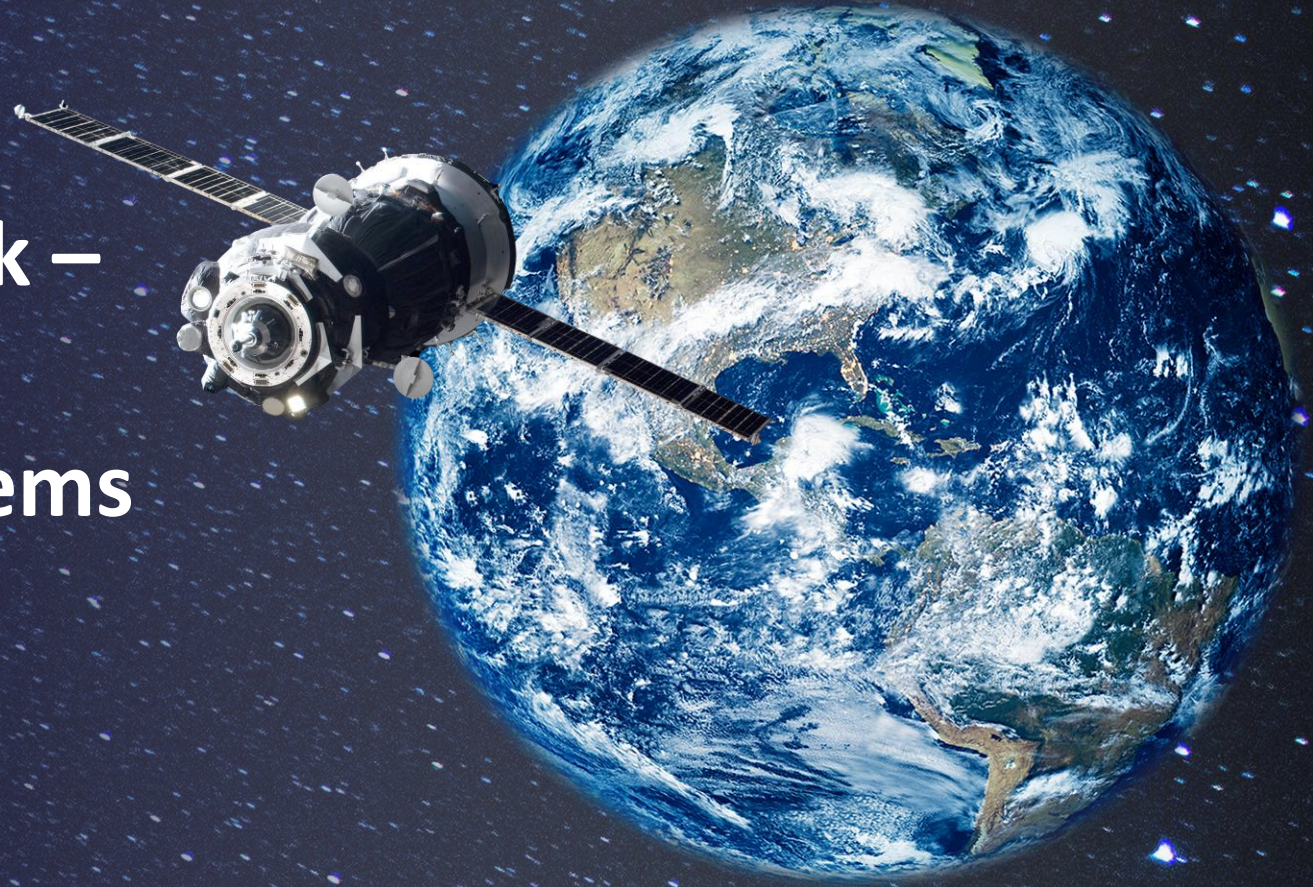


High Level Seminar of Space for Development
31 August -02 September 2026, Shanghai, China



ITU Regulatory Framework – The Future for Space Systems



Jorge Ciccorossi
Head, Space Strategy and Sustainability Division
Radiocommunication Bureau
International Telecommunication Union

ITU and the Space Sector:



194 Member States



+ 2700 Satellite Networks/Systems
Notified and Operating



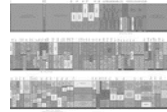
+1000 Private Sector Members



+ 4000 Satellite Networks/Systems
under process of Coordination/API



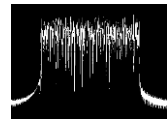
+150 Academia Members



6.8 THz of Spectrum Coordinated and
Recorded



+ 62 Years Regulating
Spectrum-Orbit Resources



99.89% Spectrum Free of Harmful
Interference

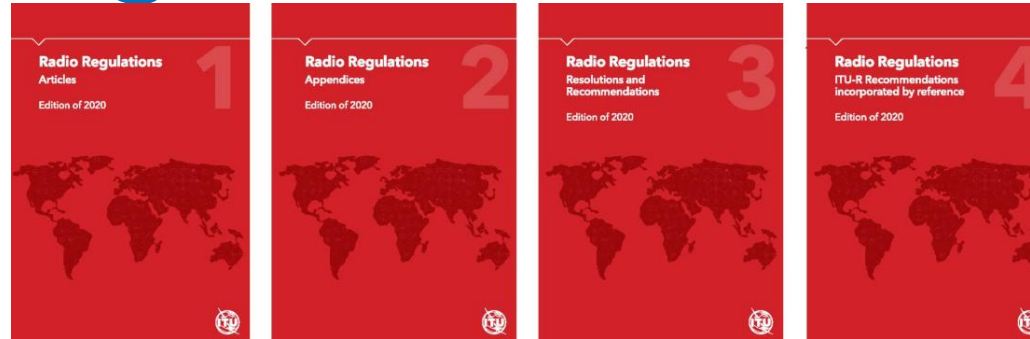


ITU Space Sustainability Forum



ITU Space Sustainability Gateway

The Radio Regulations



Intergovernmental treaty
governing the use of spectrum/orbit resources
by Member States

Define the rights and obligations of Member States in respect of the use of these resources

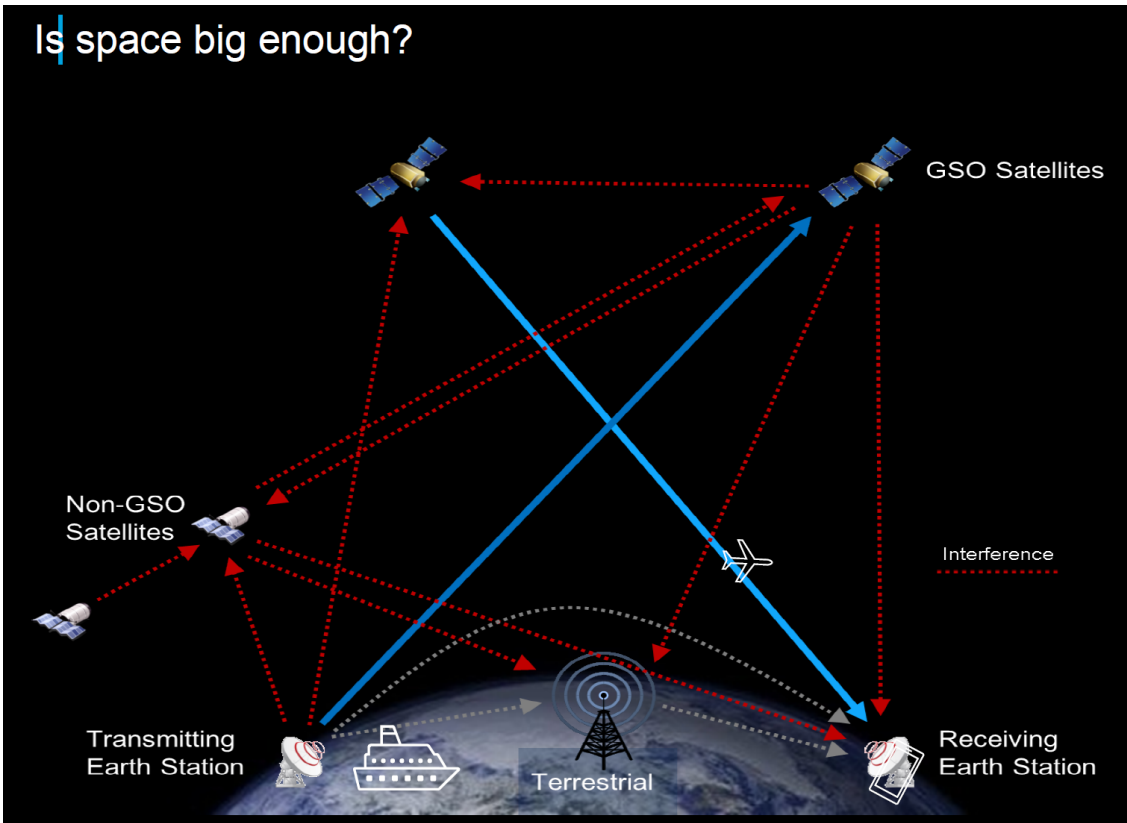
Recording of a frequency assignment in the Master Register (MIFR) provides international recognition

Updated every 4 years by World Radiocommunication Conferences (WRC)

Complemented by Rules of Procedure adopted by the Radio Regulations Board

Regulatory and Technical Solutions

Is space big enough?



5 Mechanisms to control interference and ensure equitable access

ALLOCATION

Frequency separation of stations of different services

POWER LIMITS

pfd to protect terrestrial services
eirp to protect space services
epfd to protect geostationary satellites from non-geostationary systems

MONITORING

International monitoring system

COORDINATION

between Administrations to ensure interference-free operations

RECORDING

In the Master International Frequency Register (MIFR)
International recognition

Access to Spectrum-Orbit Resources

Two approaches for recording in MIFR

Coordination Approach

Based on requirements as they come

Non-plan Services

Planning Approach

A priori planning for future use

Plan Services

**Rational, Efficient,
Economical Use**

Equitable Access

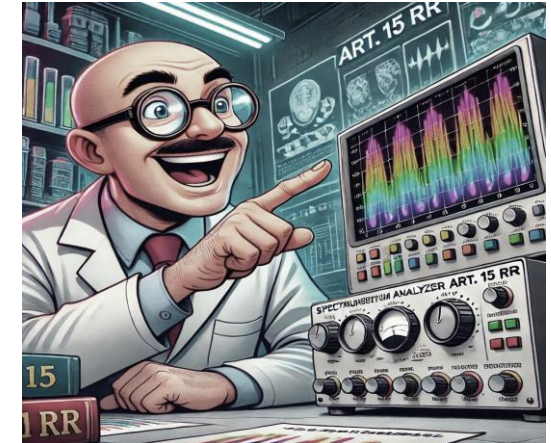
Space Radio Monitoring at ITU - Why?

To identify, geolocate and eliminate harmful interference to space services when Administrations request assistance from BR under No 13.2

“ if we cannot measure it, we cannot manage it ”

ITU Space Radio Monitoring Website

- Map with Technical Characteristics and PoCs for Monitoring Stations
- Recommendations, Reports
- Regulatory and Administrative Information
- Report ITU-R SM. 2182-1
- LIST VIII Article 16 → International Monitoring System
- Memoranda of Understanding signed with Germany, Pakistan, Korea, China, Vietnam, Belarus , Brazil, Oman, Qatar and Greece.



SPECTRUM ALLOCATION → WRC-27



- ❑ We expect more spectrum to be allocated to space services
- ❑ 80% of its agenda is space-related
- ❑ To enable deployment of new technologies including D2D, IoT MSS, intersatellite links and cislunar communications, among other services and applications.



SPECTRUM FOR MSS – IOT
WRC AI 1.12

Consider allocations to the mobile-satellite service in the frequency bands required for the future development of **low-data-rate NGSO MSS**

Space-to-Earth	Earth-to-Space
1 427 - 1 432 MHz	
1 645.5 - 1 646.5 MHz	
1 880 - 1 920 MHz	
2 010 - 2 025 MHz	

Relevant for the development of the **Internet of Things (IoT)**

- **WP 4C's** studies include the technical description of **LDR-MSS** systems, spectrum requirements, technical and operational characteristics, and coexistence mechanisms for low data rate systems and existing primary services



KEY CHALLENGING ISSUES

- A. Description of Low Data Rate
- B. Overlapping frequency bands with other agenda items
- C. Sharing among Low Data rate systems
- D. Use of the 1.6GHz band
- E. Transmissions in the opposite direction in the 2GHz band within Region 2

DIRECT-TO-DEVICE (WRC-27 AI 1.13)

- ❑ Possible **new allocations to the mobile-satellite service** to enable direct to device connectivity to complement terrestrial IMT coverage
- ❑ Frequency range **between 694/698 MHz and 2.7 GHz** taking into account Rec. ITU-R M.1036

FREQUENCY BANDS AGREED TO BE STUDIED UNDER AI 1.13 (Resolves 1)

694/698 – 960 MHz

1 427 – 1 518 MHz

1 710 – 2 025 MHz
2 110 – 2 200 MHz

2 300 – 2 400 MHz

2 500 – 2 690 MHz

➤ WP 4C

- **Description and functionality** of MSS systems for direct connectivity between space stations and IMT user equipment
- **Sharing and compatibility** studies with incumbent services

➤ WP 5D

Technical considerations for **protection of terrestrial IMT** systems are being conducted and three primary approaches are currently being evaluated



KEY CHALLENGING ISSUES

- A. **Coexistence** between satellite and terrestrial networks
- B. **Responsibilities and roles** of satellite and mobile network operators, as well as corresponding administrations
- C. **Cross-border coordination**

FUTURE MSS – ADDITIONAL ALLOCATIONS

WRC-27 – AGENDA ITEM 1.14

- ❑ **Consider possible new allocations to the mobile-satellite service in the following frequency bands:**

Regions 1 and 3

2010-2025 MHz (Earth-to-space)

2160-2170 MHz (space-to-Earth)

Globally

2 120-2 160 MHz (space-to-Earth)

- ❑ **WP 4C is conducting sharing and compatibility studies while clarifying technical parameters as well as the protection criterion related to interference to GSO MSS**



ESIMS

- WRC-15 and subsequent conferences adopted and refined new regulatory framework to allow **earth stations in motion** to communicate with space stations of **fixed-satellite service (FSS)**
- WRC-23 approved technical, regulatory, and operational procedures for aeronautical and maritime ESIMs to communicate with **GSO networks and NGSO FSS systems**
 - **GSO: 12.75-13.25 / 27.5-29.5 GHz** (Earth-to-space), **17.7-19.7 GHz** (space-to-Earth)
 - **NGSO: 27.5-29.1 / 29.5-30 GHz** (Earth-to-space), **17.7- 18.6 / 18.8-19.3 / 19.7-20.2 GHz** (space-to-Earth)
- **WRC-27 will follow similar direction and consider additional frequency bands for ESIMs GSO and NGSO: 47.2-50.2 / 50.4-51.4 GHz (Earth-to-space)**



EQUITABLE ACCESS (WRC-27 – AI 1.6)

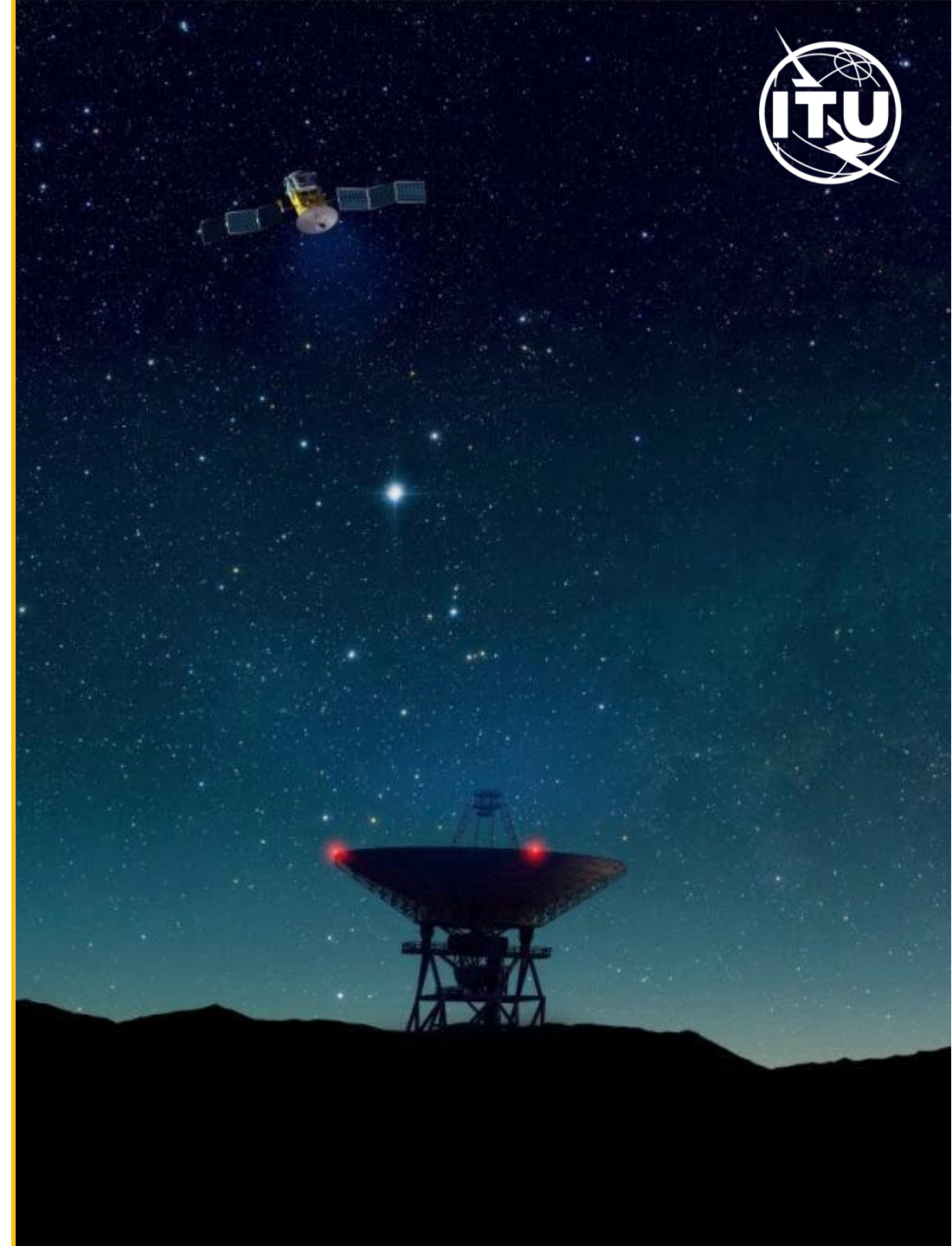
Consider technical and regulatory measures for **FSS satellite** networks/systems for **equitable access to these frequency bands**:

- 37.5-42.5 GHz (space-to-Earth),
- 42.5-43.5 GHz (Earth-to-space),
- 47.2-50.2 GHz (Earth-to-space) and
- 50.4-51.4 GHz (Earth-to-space)



SPACE SCIENCE

- ❑ Allocations to Space Research (space to space) for **Cislunar Communications** (AI 1.15)
- ❑ Primary Global Allocation to **EESS in 4 200-4 400 MHz and 8 400-8 500 MHz** (AI 1.19)
- ❑ Protection of radio astronomy operating in specific **Radio Quiet Zones** (RQZ) from aggregate interference caused by systems in the non-GSO satellite (AI 1.16)
- ❑ Protection of **the Earth exploration-satellite service (passive) and the radio astronomy** service in certain frequency bands above 76 GHz from unwanted emissions of active services (AI 1.18)
- ❑ Protection of **Space Weather Sensors** (AI 1.17)



NGSO LARGE CONSTELLATIONS

Studies on Relaxation of EPFD limits protecting GSO Satellite Networks from NGSO Large Satellite Constellations (Not an Agenda Item)

Unauthorized operations of non-geostationary-satellite orbit earth stations in the fixed-satellite (FSS) and mobile-satellite services (MSS) (WRC-27 AI 1.6)

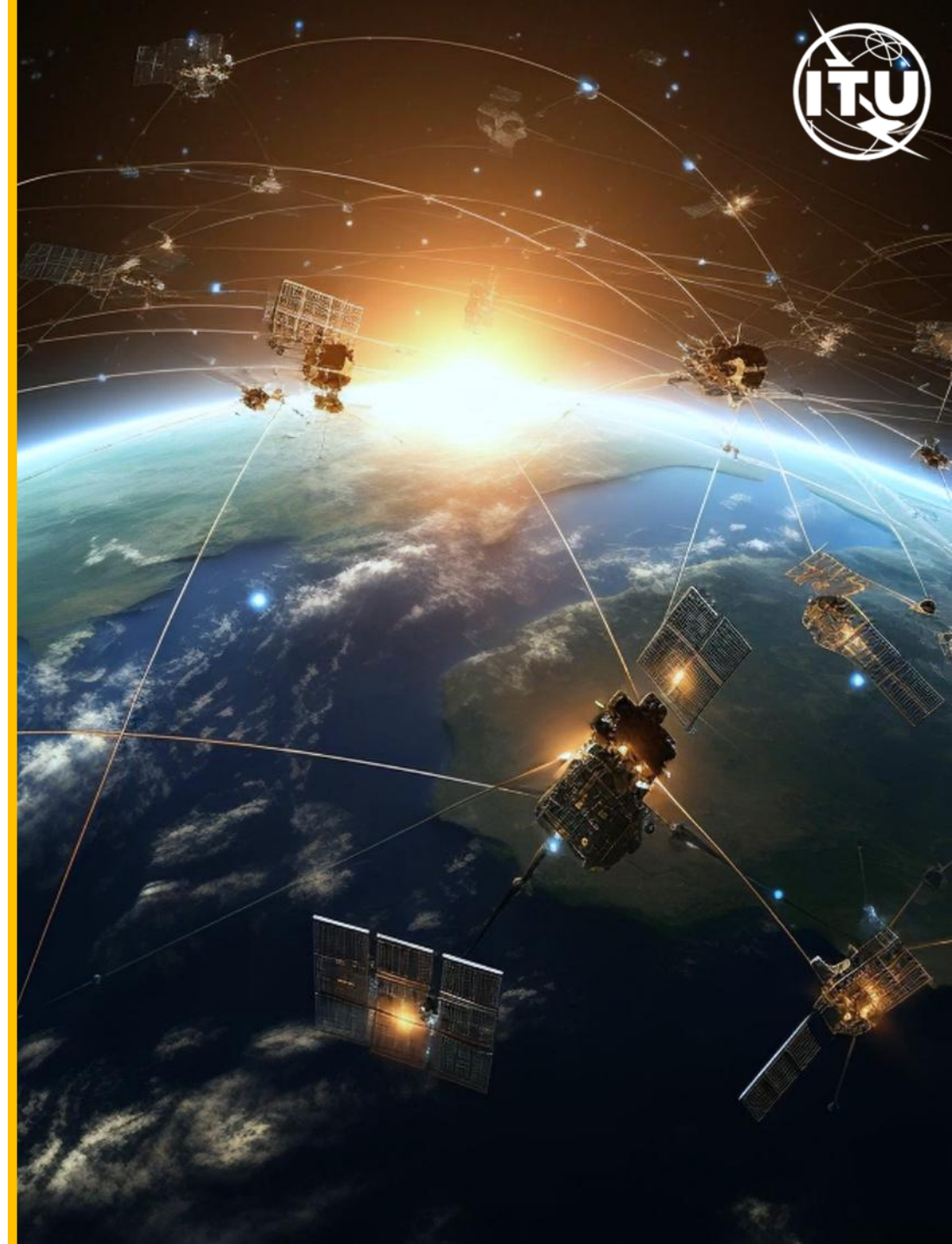
NGSO-GSO Intersatellite Links in 1 518-1 544 MHz, 1 545-1 559 MHz, 1 610-1 645.5 MHz, 1 646.5-1 660 MHz, 1 670-1 675 MHz and 2 483.5- 2 500 MHz allocated to the mobile-satellite service (AI 1.11)

Gateways to NGSO in 51.4 - 52.4 GHz (uplink)

OTHER TOPICS

Other Regulatory issues under AI 7

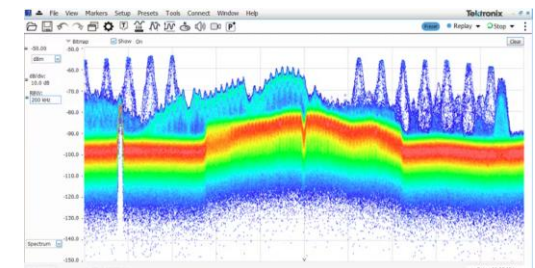
Smaller Antennae for FSS in 13.75-14 GHz (AI 1.2)



| Space Sustainability – Why ?



- ❑ Global Communications and Modern Infrastructure relies on Space Based Systems : RNSS (GPS, Beidou, Galileo, Glonass) Time Synchronization, Satellite Broadcasting, Mobile Devices, Monitoring of the Planet, Rural Communications
- ❑ Higher Demand, Acceleration in the Space Sector: Satellite Frequency Coordination Requests and Launches are growing exponentially
- ❑ Higher Risk of Interference and Physical Collisions in Space can degrade the efficiency and ultimately access to spectrum orbit resources



Space Sustainability – Why at ITU ?



- ❑ ITU Member States instructed SG, BR Director and ITU-R Sector to take a series of actions: Resolution 219 (PP-2022), Resolution 74 (RA-2023)
- ❑ 61 years of experience in regulating Spectrum-Orbit Resources (since 1st Space Conference in Geneva in 1963)
- ❑ Interrelation between the Space Environment and Efficient Use / Access to Spectrum-Orbit Resources (core responsibility from ITU)
- ❑ ITU provides the right balance across all regions and space sectors, giving a voice to governments as well as to the industry in a moment when the private sector is boosting space activities.



ITU Space Sustainability Forum



- ❑ **6000 + Attendees**
(in person + online and offline)
- ❑ **143 Countries**
- ❑ **60 + C Level and Expert Speakers**
- ❑ **Governments, Satellite Operators, Space Agencies, UN Agencies, Industry, Academia, Civil Society**



➤ **1st Edition- Geneva 2024: Identified needs for action**

- 1-Data Sharing
- 2-Awareness and Education
- 3-Regulatory Framework
- 4-Technical Solutions
- 5-Partnerships



www.itu.int/SSF

➤ **2nd Edition Geneva 2025 : Followed-up progress and Delivered Outputs**

- 1- ITU publishes Directory with Points of Contact for RFI and Satellite Operations (CA 272)
- 2- ITU releases Argus online application to visualize NGSO Large Constellations Deployment and associated orbital tolerances in accordance with Resolution 8 WRC-23.
- 3- ITU Space Connect and SSF series of educational sessions.
- 4- SSA, Global Space Traffic Coordination and NGSO Spectrum Monitoring tools presented by the Industry
- 5- Updates on Regional and National Space Laws
- 6- Communications and networking facilitated among key Space Stakeholders
- 7- Insightful discussions on latest innovations and next challenges.

➤ **3rd Edition: 12-14 October 2026 in Riyadh, Saudi Arabia**

Space Sustainability Gateway



Quick Points of Contact

- [Administrations](#)
- [Satellite Operators / Space Agencies](#)
- [Contact Us / Suggestions](#)

www.itu.int/space-sustainability/



Policies



Guidelines,
Codes of Conduct and
Best Practices *



Strategies for post mission Deorbiting or Disposal of
spacecrafts

by Administration, Organization and Satellite System
(Responses to CA/272) *

Spectrum



ITU Master International Frequency Registry
(MIFR)



ITU Space Radio-Monitoring

Regulatory



ITU-R Resolution 74
(RA 2023)



ITU PP Resolution 219
(Bucharest 2022)



ITU Circular Letter
CA/272



Ongoing Work
ITU-R Study Group 4

Resources on Space Environment:



Online Satellite Catalogs



Collision Avoidance



Environment Reports
ESA's Space Environment Report 2023



Environmental protection of the
geostationary-satellite orbit
(Recommendation ITU-R S.1003-2)



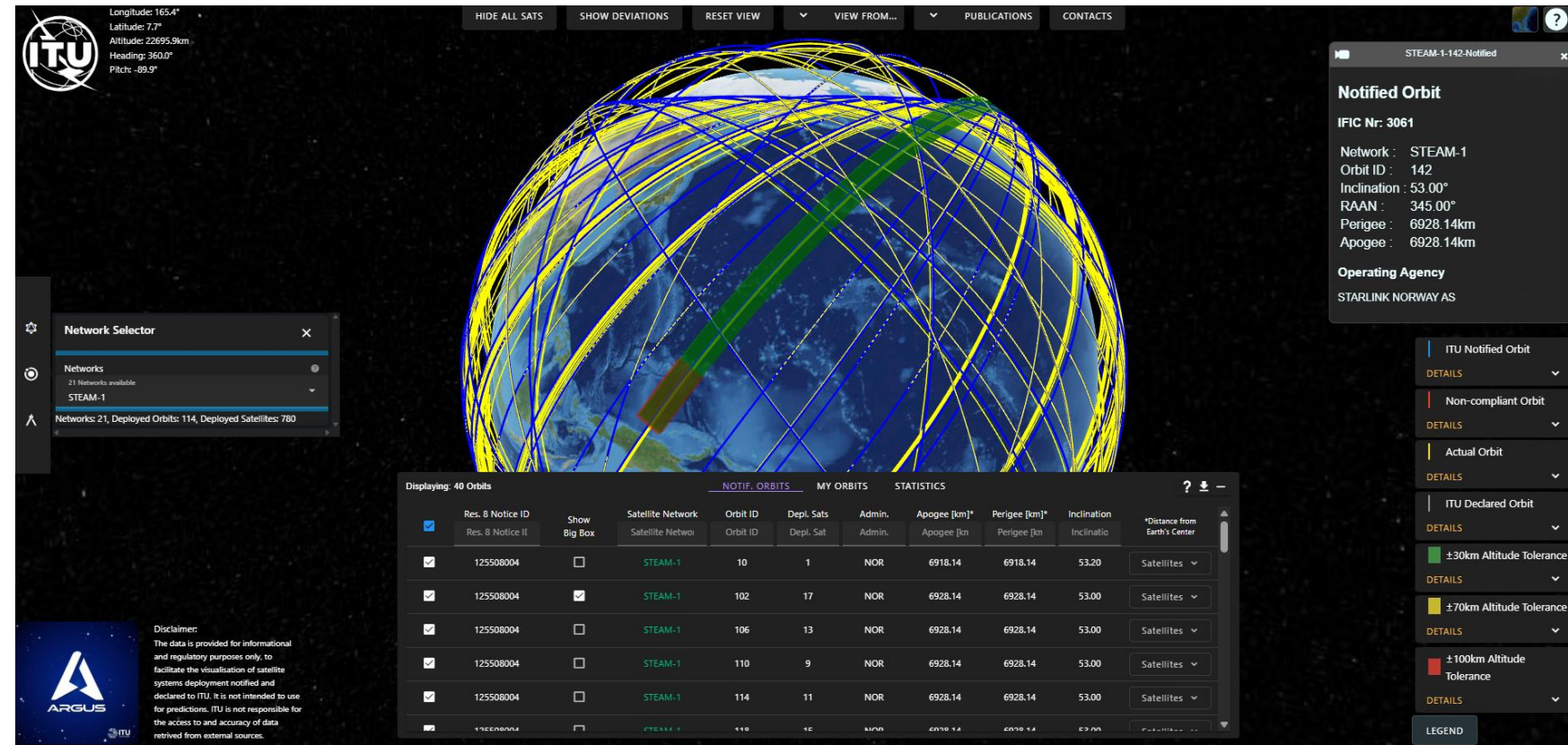
Space Debris – UN Inter-Agency
Meeting Special Report to COPUOS
Section K related to ITU



Long-term Sustainability of Outer
Space Activities – UNOOSA
Information Repository

To visualize NGSO Deployment and Orbital Tolerances under WRC-23 Resolution 8

- ✓ Notified and Observed orbital parameters
- ✓ Deviations from Nominal Orbital Parameters
- ✓ Filters by satellite system, apogee, perigee, RAAN, inclination, frequencies
- ✓ Satellite Operator Direct Point of Contact
- ✓ TIES Restricted to ITU Members
- ✓ Linked to Space Explorer for Milestones Status and frequency assignments in MIFR



<https://www.itu.int/space-argus/>



ITU-R Study Groups actions on Space Sustainability

ITU Radiocommunications Assembly adopted by consensus Resolution 74 (RA-23) :

- 1) to develop and finalize during the next study cycle a **Handbook on best practices for the sustainable use of frequencies and associated non-GSO orbits** by space radiocommunication services, including individual experiences and guidelines adopted by Member States and Sector Members
- 2) to conduct studies towards the development of a **new Recommendation** providing guidance on **safe and efficient deorbit and/or disposal strategies and methodologies for non-GSO space stations** involved in radiocommunication services after the end of their life, focusing on the radio-frequency spectrum and associated satellite-orbit resources used by space services,



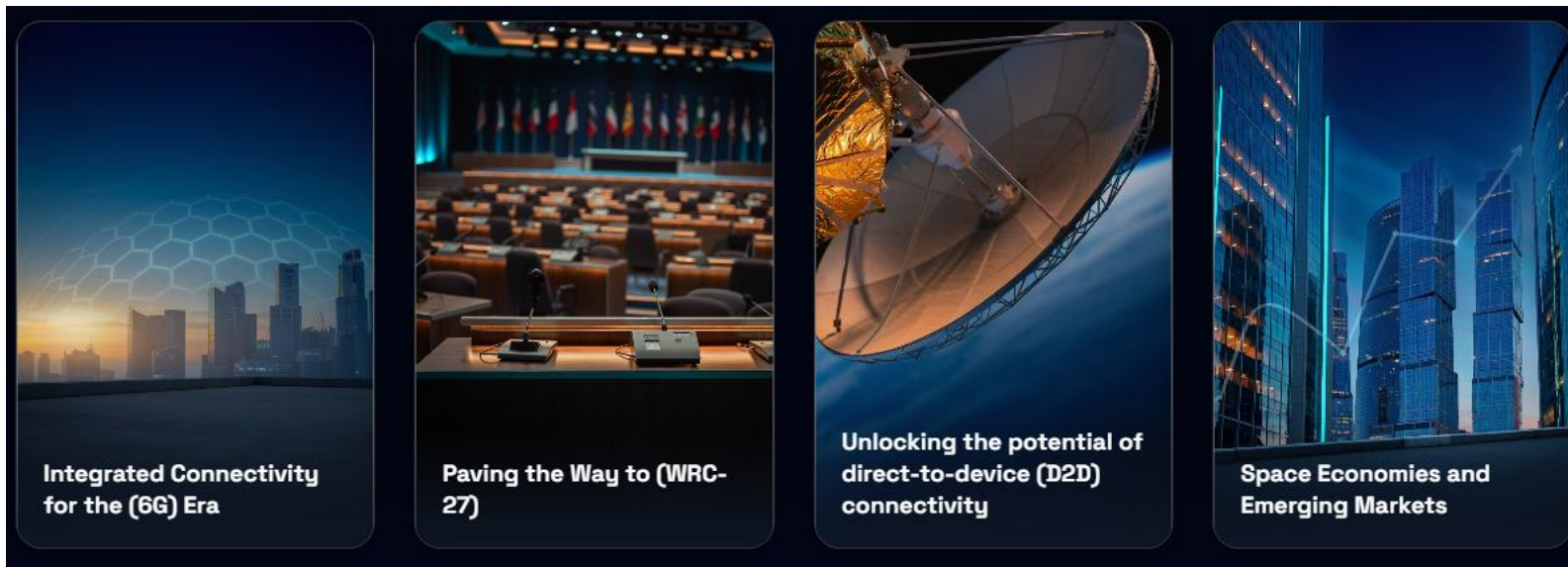
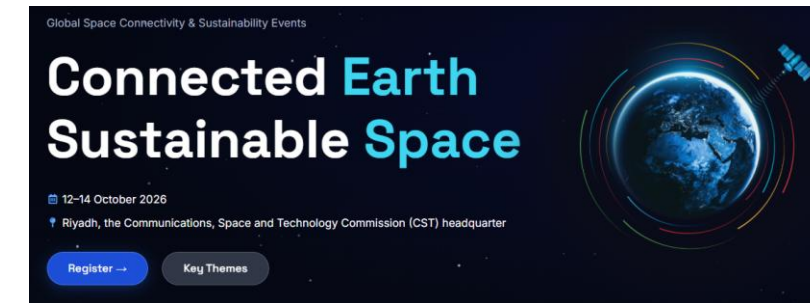
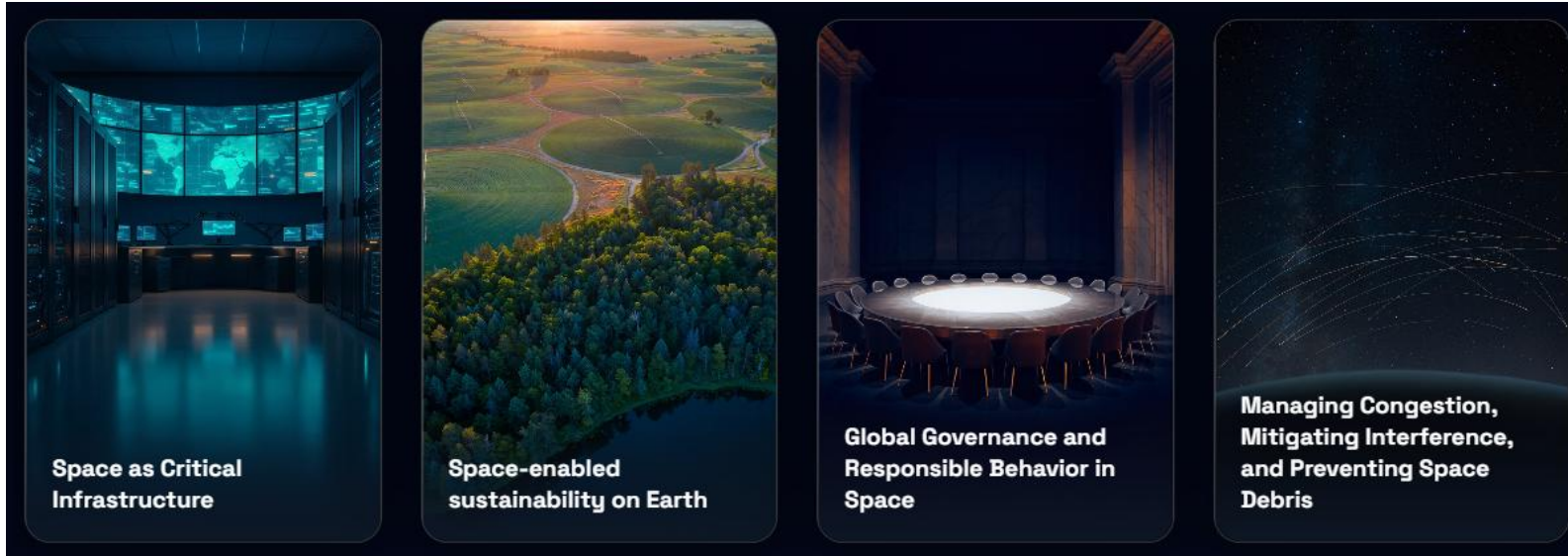
Work ongoing at WP-4A

**You are invited to submit studies
by 7 Oct. 2026 16:00hs UTC**

Space Sustainability – What's Next ?



❑ **3rd. ITU Space Sustainability Forum:** 12-14 October 2026 – Riyadh !



In Summary



Why ITU Regulatory Framework and WRC Process ?

- To enable the deployment of latest satellite technologies by allocating the necessary spectrum and specifying sharing conditions
- To maximize harmonization, benefiting from economies of scale
- To ensure operation free of harmful interference
- To guarantee the success of your space mission and the return of your investment
- To leverage connectivity, development and the space economy
- To ensure long-term sustainability of space activities !

JOIN THE ITU

itu-r_membership@itu.int

**See you in Shanghai
at
WRC-27 !**

Thank You !



194
MEMBER STATES



1000+
PRIVATE SECTOR
ORGANIZATIONS



170
ACADEMIA
MEMBERS

