CEPT Workshop on

European Spectrum Management and the WRC process

21 June 2022, Copenhagen, Denmark

Session 2

The World Radio Conference: enabling radiocommunications globally

Part 1

ITU Radiocommunication Sector (role and structure)

Philippe Aubineau

Counsellor, ITU-R Study Groups,

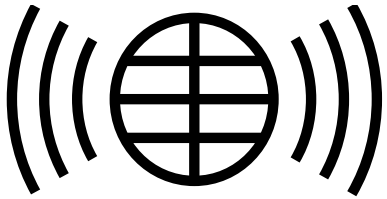
Radiocommunication Bureau, ITU

Overview

- ITU: Brief history and structure
- ITU Radiocommunications Sector (ITU-R)
- ITU Radiocommunications Bureau (BR)

Who are we?

ITU is the United Nations **specialized agency for Information and Communication Technologies** (ICTs)



Enabling a **connected world**

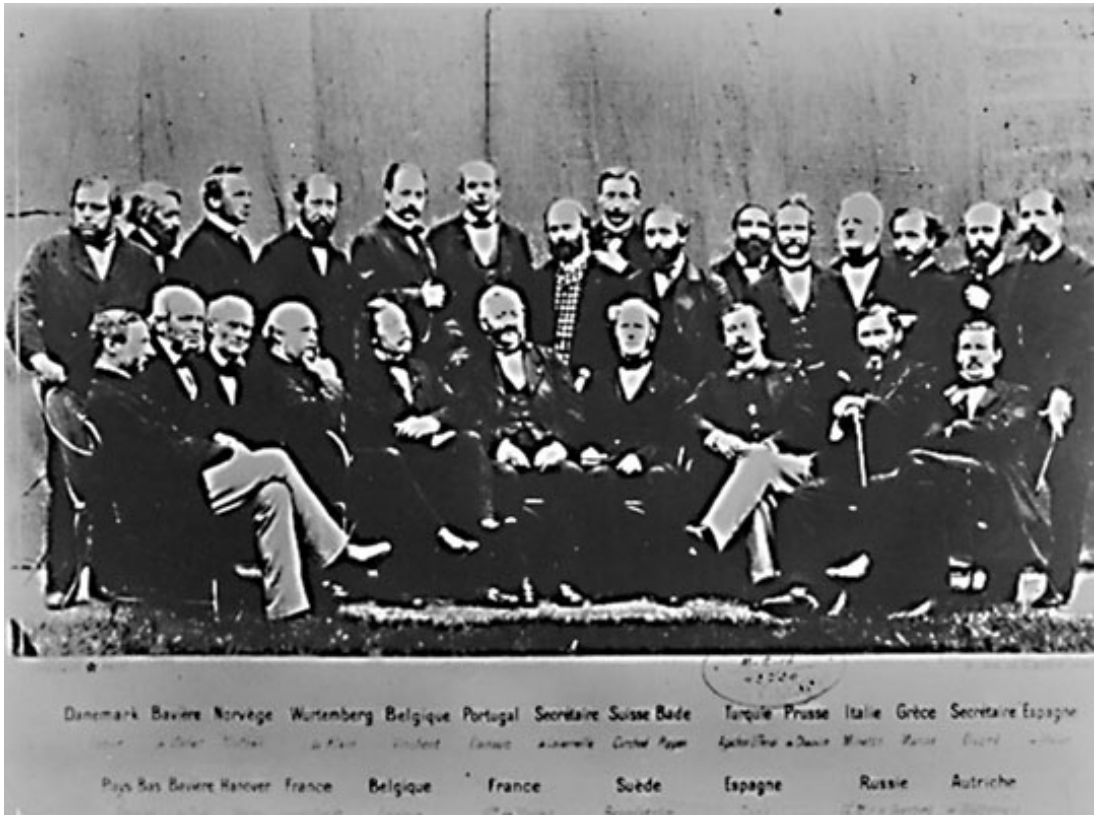
International Telegraph Union

157 years old : founded on 17 May 1865
by 20 nations

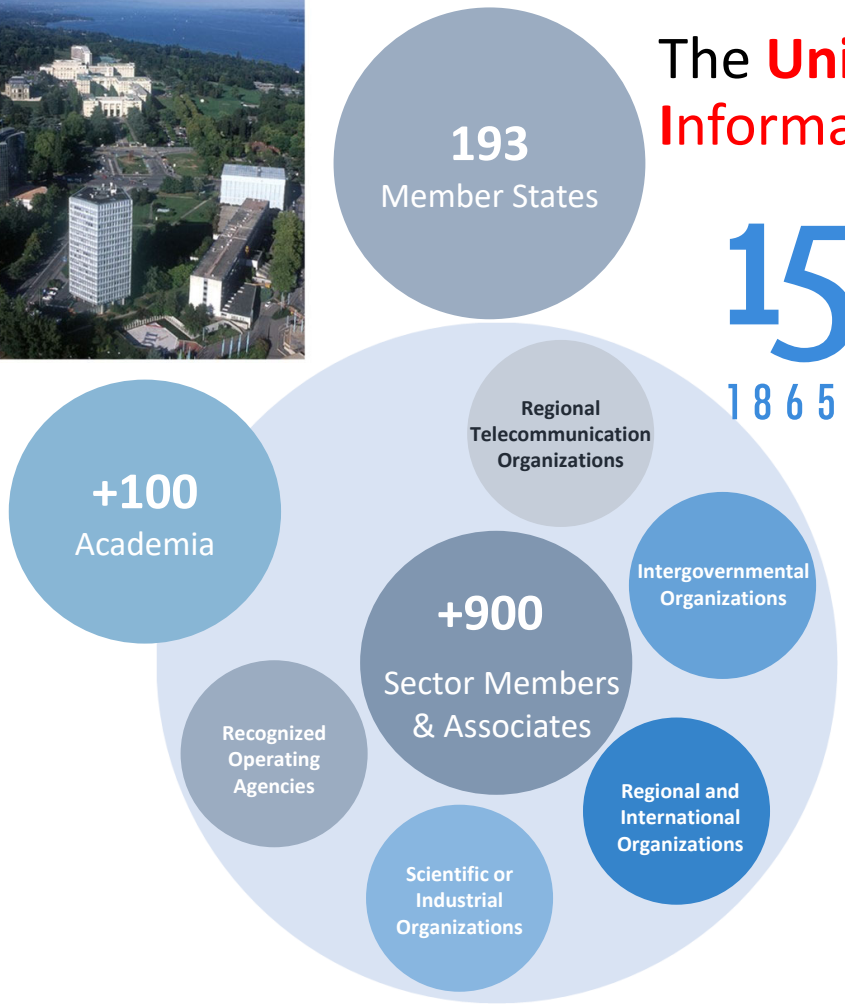
- common rules to standardize equipment to facilitate international interconnection,
- adopted uniform operating instructions which would apply to all countries,
- common international tariff and accounting rules.

Took ITU name on 1934

Became UN agency on 1947



International Telecommunication Union



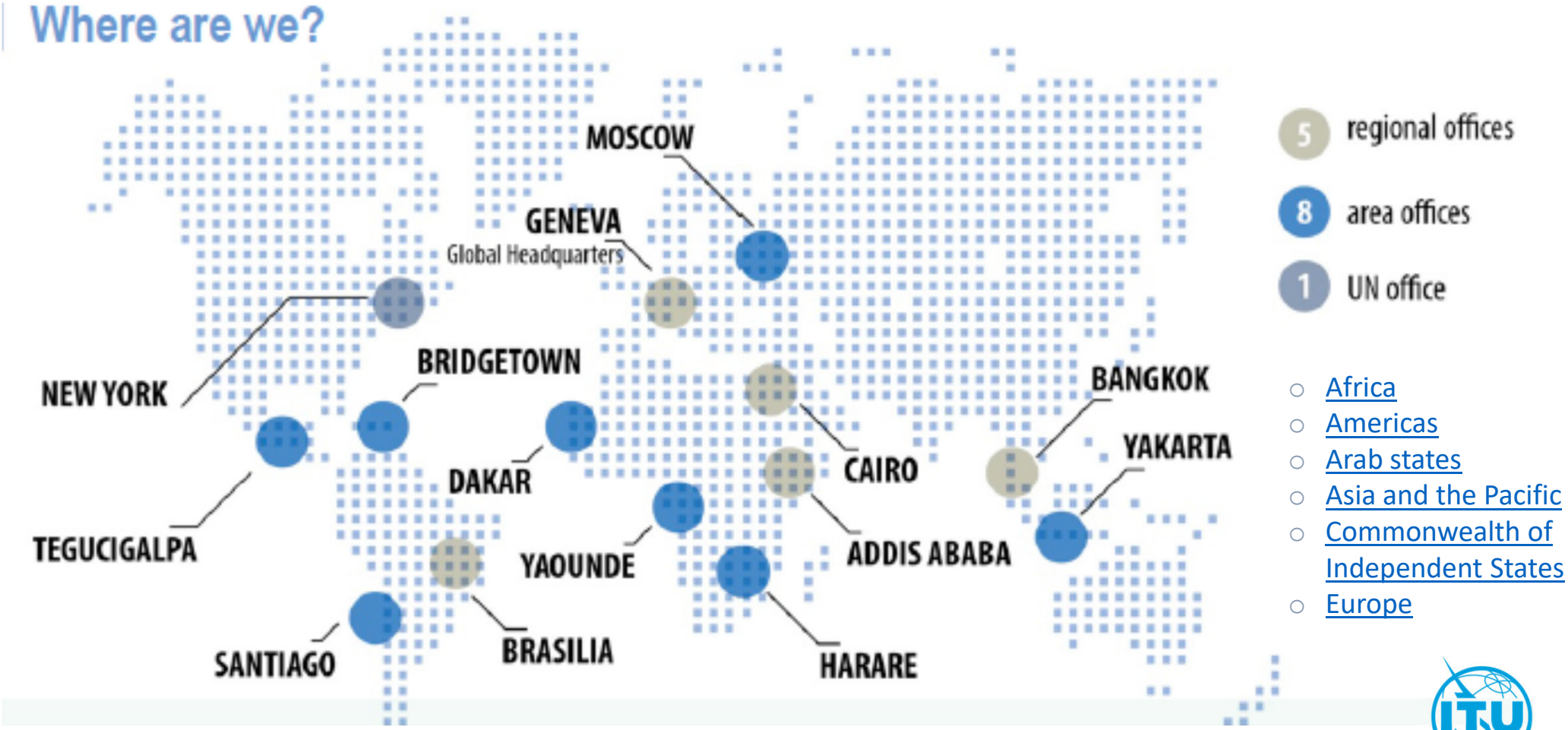
The **United Nations Specialized Agency** for **I**nformation and **C**ommunication **T**echnologies (ICTs)

2015 marked **150 years of experience** and innovation (www.itu.int)

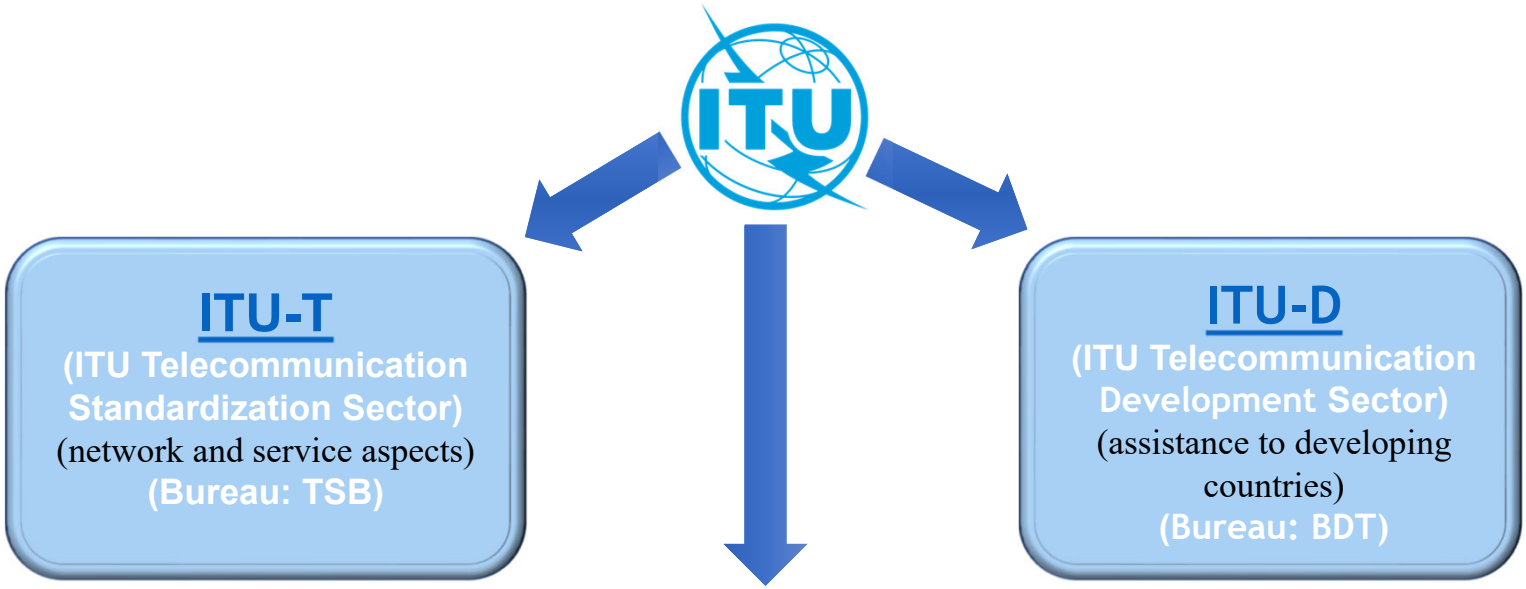
Governments, industry and academia working together at ITU to:

- ✓ **Effect allocation of spectrum**
- ✓ **Facilitate the worldwide standardization of telecommunication**
- ✓ **Technical assistance to developing world**
- ✓ **Harmonization the development of telecommunication facilities**

ITU Locations - Global Presence



ITU Sectors



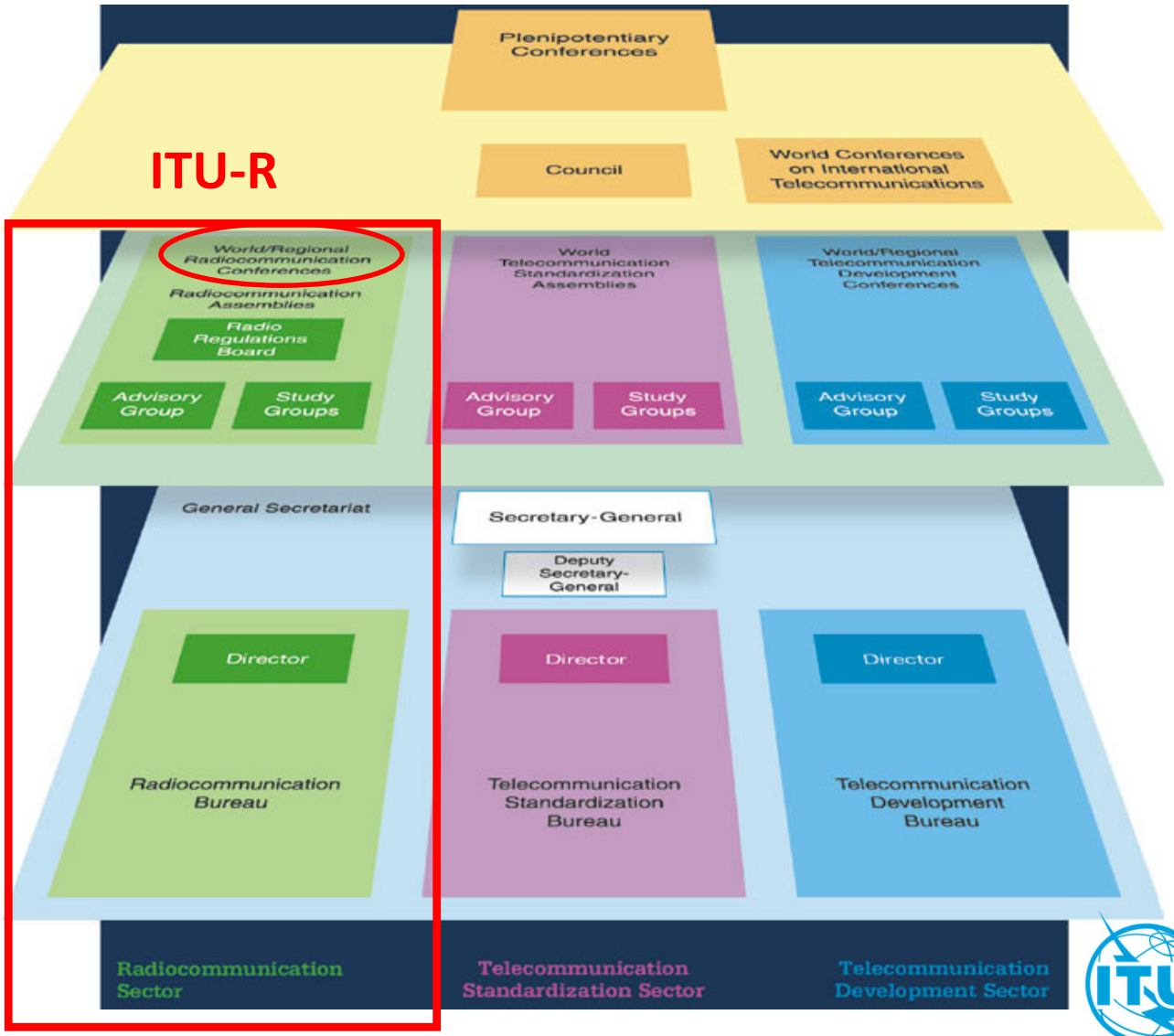
ITU-T
(ITU Telecommunication Standardization Sector)
(network and service aspects)
(Bureau: TSB)

ITU-D
(ITU Telecommunication Development Sector)
(assistance to developing countries)
(Bureau: BDT)

ITU-R
(ITU Radiocommunication Sector)
Defines and manages the international regulatory framework on the use of spectrum and satellite orbits;
Develops worldwide standards on radiocommunications
(Bureau: BR)

ITU Structure

Committed to
Connecting the World



Legal Framework (ITU Treaties) - Instruments of the ITU (CS Art. 4)

ITU is ruled by legal instruments, configured as international treaties and therefore binding for all signatory States

- **Constitution (CS) of the ITU**
- **Convention (CV) of the ITU**
- **General Rules (GR)** of conferences, assemblies and meetings of the Union
- **Optional Protocol** on the Compulsory Settlement of Disputes Relating to the CS, CV and Administrative Regulations
- **PP Decisions, Resolutions & Recommendations**

www.itu.int/pub/S-CONF-PLEN-2015

Administrative Regulations:

- **International Telecommunication Regulations**
- **Radio Regulations (RR)**
  - ✓ Articles (Vol. 1)
  - ✓ Appendices (Vol. 2)
  - ✓ W(A)RC Resolutions & Recommendations (Vol. 3)
  - ✓ ITU-R Rec. incorporated by reference (Vol. 4)

www.itu.int/pub/R-REG-RR

ITU Radiocommunication Sector

Committed to Connecting the World

KEY ROLE

Global management of **radio-frequency spectrum** and**,** for space stations, their associated **satellite orbits**

Ensuring the **rational**, **equitable**, **efficient** and **economical** use of the radio-frequency spectrum by all radiocommunication services

Carrying out **studies** and adopting **recommendations (standards)** and technical reports/handbooks on radiocommunication matters

Mario Maniewicz, Director
ITU Radiocommunication Bureau

Radiocommunication Sector (ITU-R)

to ensure interference free radio services through

implementation and efficient & timely update of the:

- Radio Regulations
- Regional Agreements

Objective

- Developing and updating international regulations on the use of spectrum and associated orbits
- Applying these regulations and managing the MIFR
- Developing and adopting standards and best practices on the use of spectrum and their orbital resources
- Disseminating information on these activities

Role/Duties

Radio standardization also establishes *´Recommendations´* intended to assure the necessary performance and quality in operating radiocommunication systems, and seeks ways and means to conserve spectrum and ensure flexibility for future expansion and new technological developments.

History of ITU-R in brief

1906 (Berlin)	International Radiotelegraph Convention (1st *Radio Regulations*)
1927 (Washington DC)	**CCIR** (International Radio Consultative Committee)
1932 (Madrid)	Telegraph & Radiotelegraph Conventions merged: the International Telegraph Union became the International Telecommunication Union
1947 (Atlantic City)	Created the IFRB (International Frequency Registration Board) ITU becomes a UN Specialized Agency
1992 (Geneva)	**ITU-R (Radiocommunication Sector)**: • **ITU-R Study Groups** (formerly CCIR) • **RRB** (Radio Regulations Board) (formerly IFRB) • **BR** (Radiocommunication Bureau)

LES
GOUVERNEMENTS
des Etats signataires de la
CONVENTION TELEGRAPHIQUE INTERNATIONALE
conclue à Paris le 17 Mai 1865, ou qui ont successivement adhéré à cette Convention, ayant résolu d'y introduire les améliorations suggérées par l'expérience et ayant, à cet effet, désigné des délégués chargés de procéder, conformément aux dispositions de l'art. 56, à la révision de la dite Convention télégraphique;
les délégués soussignés se sont réunis en Conférence à Vienne, et ont arrêté, d'un commun accord, sous réserve de l'approbation de leurs Gouvernements respectifs, les modifications suivantes, applicables à partir du 1er Janvier 1869.

TITRE PREMIER
du réseau international.

Article 1.

Les Hautes Parties contractantes s'engagent à affecter au service télégraphique international des fils spéciaux en nombre suffisant pour assurer une rapide transmission des dépêches.

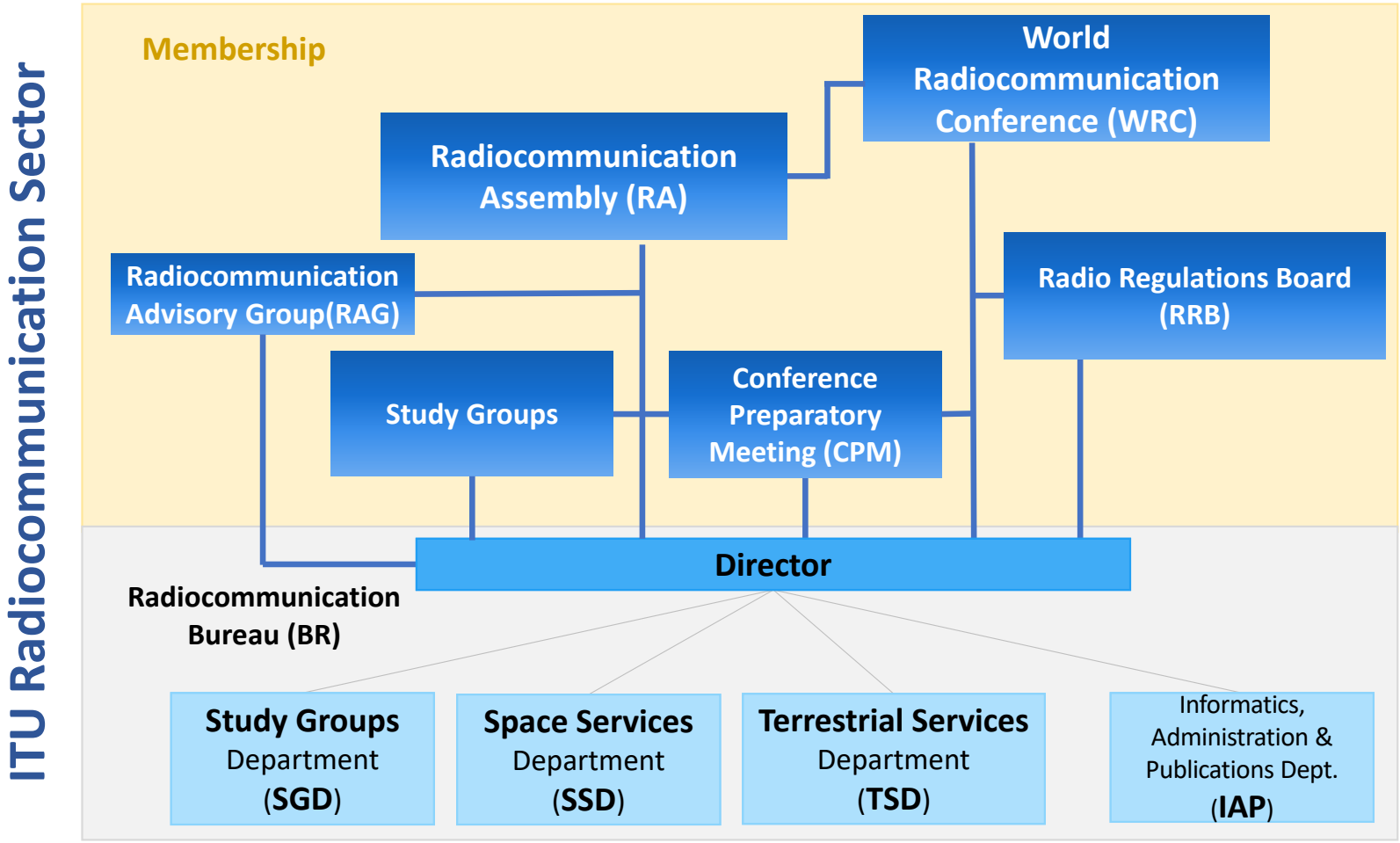
ITU-R Membership by the Numbers

193 MEMBER STATES

299 PRIVATE SECTOR ORGANIZATIONS

166 ACADEMIA MEMBERS

ITU-R and BR Structure



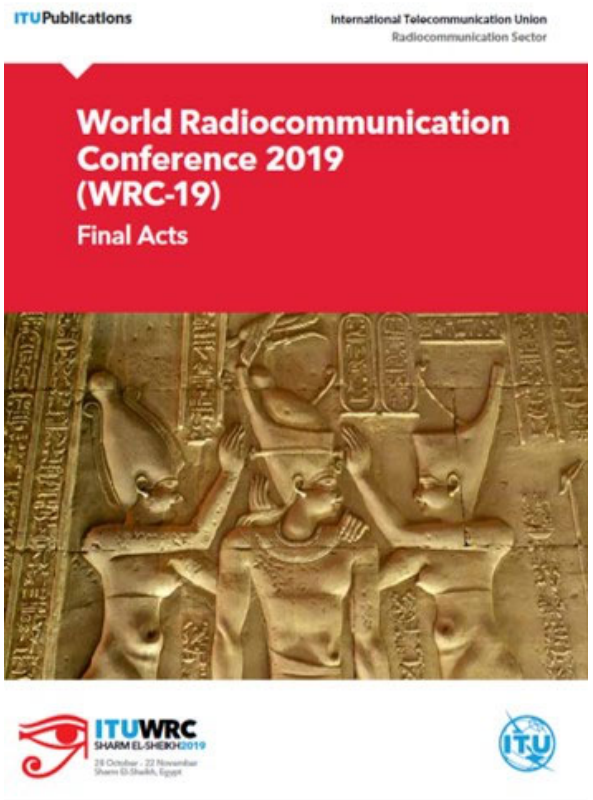
World Radiocommunication Conferences (WRC)

update the Radio Regulations, the international treaty governing the use of the radio-frequency spectrum and satellite orbits

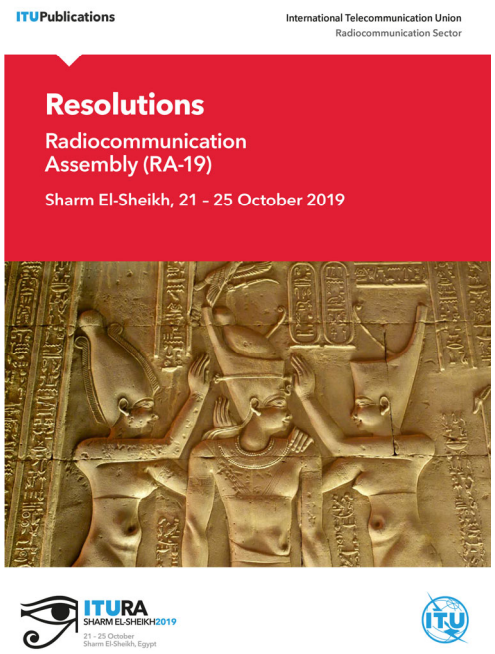
and

ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services

Mobile | Satellite | Maritime | Emergency | Aviation | Broadcasting | Science



Radiocommunication Assembly (RA)



The Administrative Body for the ITU-R, the RA's duties include:

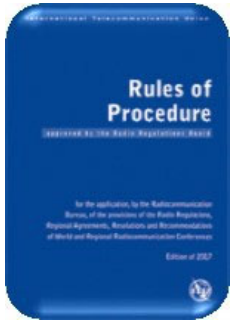
- Establishing **structure and mandates for ITU-R Study Groups**
- Adopting **ITU-R Resolutions** and **study Questions**
- Establishing the **working methods** of the ITU-R
- Electing **leadership (Chairmen and Vice-Chairmen) of ITU-R Study Groups, CPM and RAG**
- Responding to **requests from ITU conferences**
- **Approving ITU-R Recommendations**

RAs are convened every 3/4 years (CS Nos. 90 & 91 - Res. 77 (PP18)), **associated in time and place with WRC (the week before)**

Radio Regulations Board (RRB)

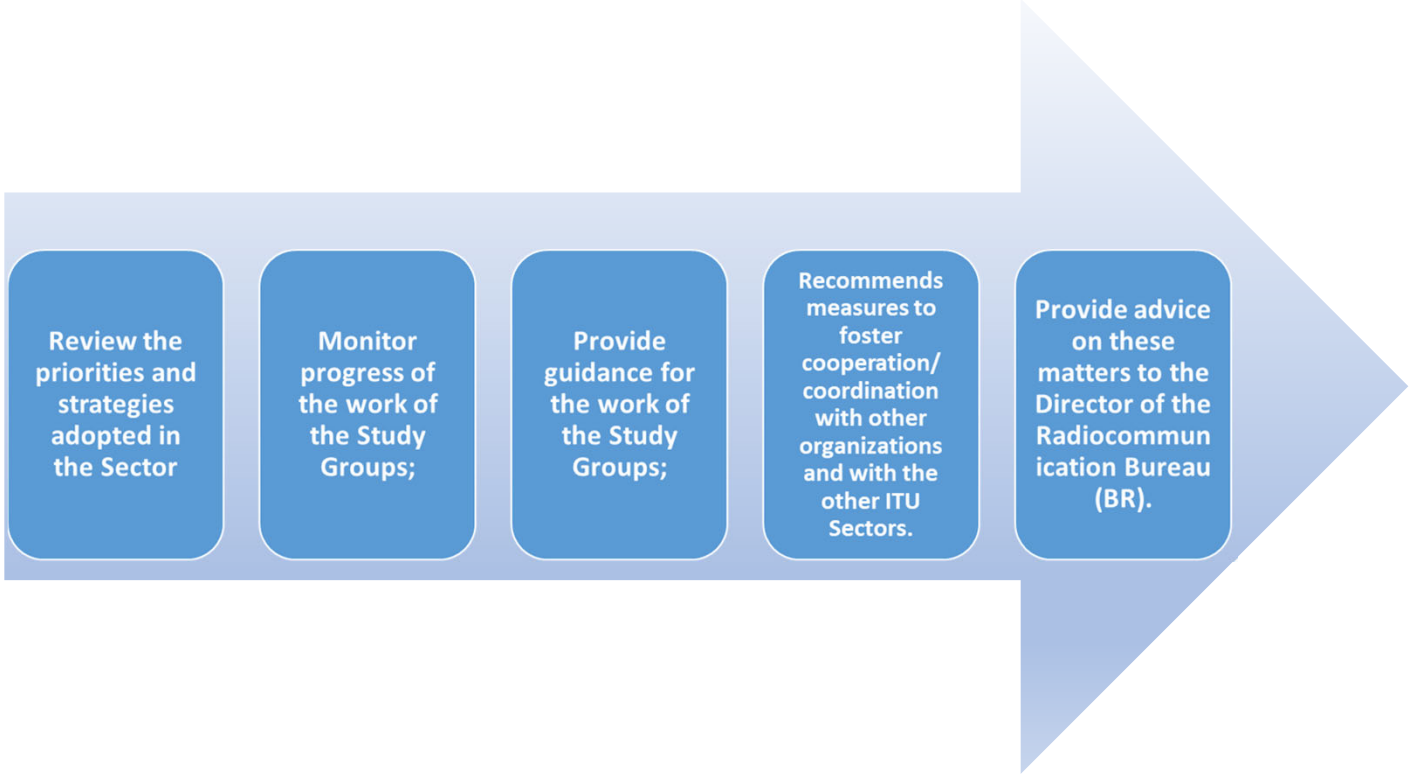
12 RRB members elected by PP for 4 years (two terms max.)

- **Consider and approve the Rules of Procedures (RoP)**
- **Consider at the request of an administration:**
  - **Appeals** on Bureau's decisions and other requests
  - **Interference issues** between countries
- **meets 3 - 4 times per year** at the ITUHQ in Geneva



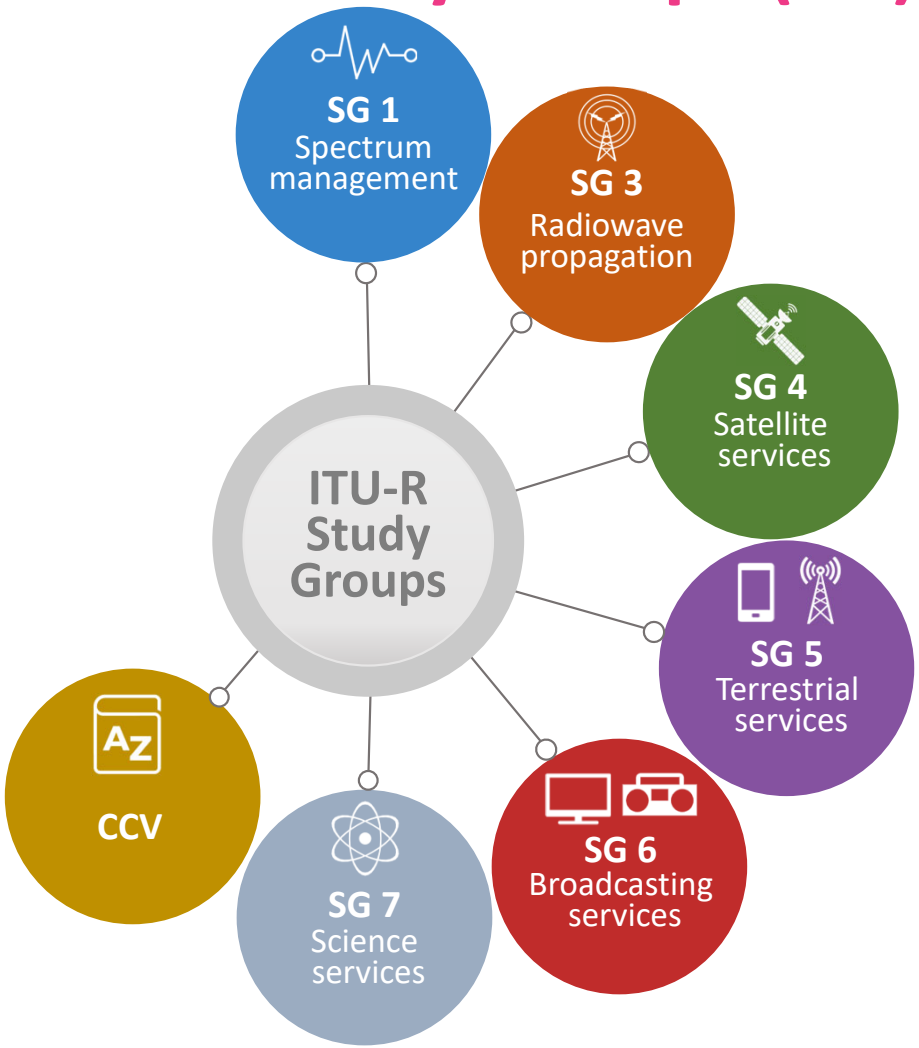
- **Address matters identified by the BR which cannot be resolved through application of the RR and RoP**
- **Provide advice to Radiocommunication WRCs** (RRCs) **and RAs**
- **Perform any additional duties prescribed by a WRC or the ITU Council**
- **Note: RRB's decisions can only be overturned by a WRC**
- **Three types of RoPs / 3 parts: > A** : RR provisions;
  > B: process, i.e. technical examination;
  > C: Internal arrangements and working methods of the Board

Radiocommunication Advisory Group (RAG)

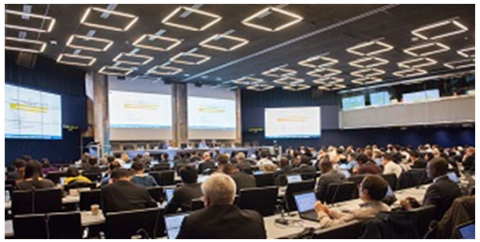


- **Radiocommunication Assemblies (RAs) may refer specific matters within its competence to the RAG.**
- **The RAG may be authorized to act on behalf of the RA between two Assemblies.**
- **RAG meets yearly, before ITU Council meeting. Open to ITU-R members.**

ITU-R Study Groups (SG)

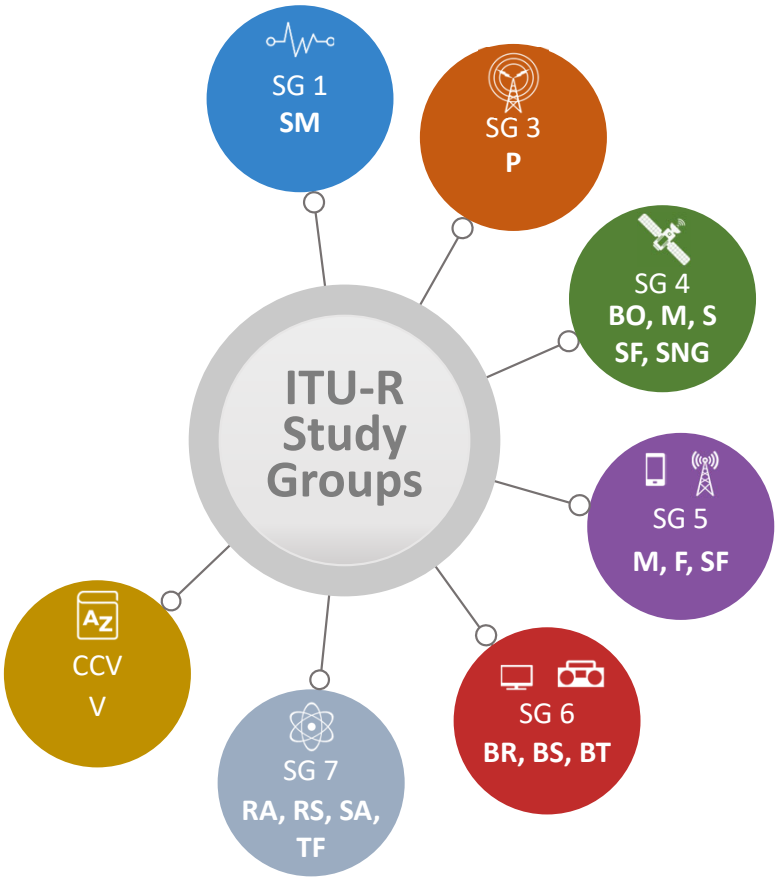


ITU-R Study Groups and their Working Parties



SG 1	WP 1A	Spectrum engineering techniques
	WP 1B	Spectrum economic approaches
	WP 1C	Spectrum monitoring
SG 3	WP 3J	Propagation fundamentals
	WP 3K	Point-to-point propagation
	WP 3L	Ionospheric propagation and radio noise
	WP 3M	Earth-space propagation
SG 4	WP 4A	Efficient orbit/satellite utilization for FSS and BSS
	WP 4B	Systems, air interfaces, performance and availability objectives for FSS, BSS & MSS
	WP 4C	Efficient orbit/satellite utilization for MSS and RDSS
SG 5	WP 5A	Land mobile, fixed, amateur and amateur-satellite services
	WP 5B	Maritime and aeronautical mobile services and radiodetermination
	WP 5C	HF and systems in the fixed and land mobile services
	WP 5D	IMT systems
SG 6	WP 6A	Terrestrial broadcasting delivery
	WP 6B	Broadcast service assembly and access
	WP 6C	Programme production and quality assessment
	TG 6/1	WRC-23 agenda item 1.5
SG 7	WP 7A	Time signals and frequency standard emissions
	WP 7B	Space radiocommunication applications & research, meteorological satellite, etc.
	WP 7C	Remote sensing systems: Earth exploration, space weather sensors, etc.
	WP 7D	Radio astronomy
CCV		**Coordination Committee for Vocabulary**

Study Group official Publications (Rec. & Rep.)

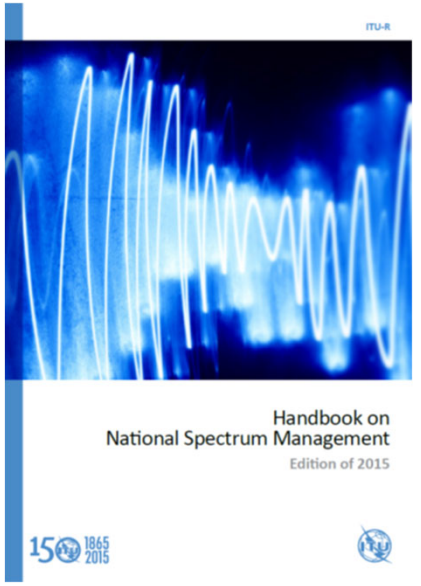


Series	Title
BO	Satellite delivery
BR	Recording for production, archival and play-out; film for television
BS	Broadcasting service (sound)
BT	Broadcasting service (television)
F	Fixed service
M/M	Mobile, radiodetermination, amateur and related satellite services
P	Radiowave propagation
RA	Radio astronomy
RS	Remote sensing systems
S	Fixed-satellite service
SA	Space applications and meteorology
SF	Frequency sharing & coordination between fixed-satellite & fixed service systems
SM	Spectrum management
SNG	Satellite news gathering
TF	Time signals and frequency standards emissions
V	Vocabulary and related subjects

ITU-R SG publications

1,175 ITU-R Recommendations

561 ITU-R Reports



42 ITU-R Handbooks

All these products can be download free of charge from ITU-R website

> 1 million downloads yearly

ITU RADIOCOMMUNICATION BUREAU (BR)

BR MANAGEMENT:

BR is headed by a **Director elected at PP**, responsible for the coordination of the work of the Sector, managing BR professional and administrative teams.

BR DUTIES:

- **Administrative and technical support** to WRCs, RAs, ITU-R SG, WPs and Task Groups
- **Applies the provisions of the RR and various Regional Agreements**
- **Records and registers frequency assignments and orbital characteristics of space services**
  Maintains the Master International Frequency Register (MIFR)
- Coordinates the preparation, editing and dispatch of **circulars, documents and publications developed within the Sector**

Mario MANIEWICZ, Director
ITU Radiocommunication Bureau

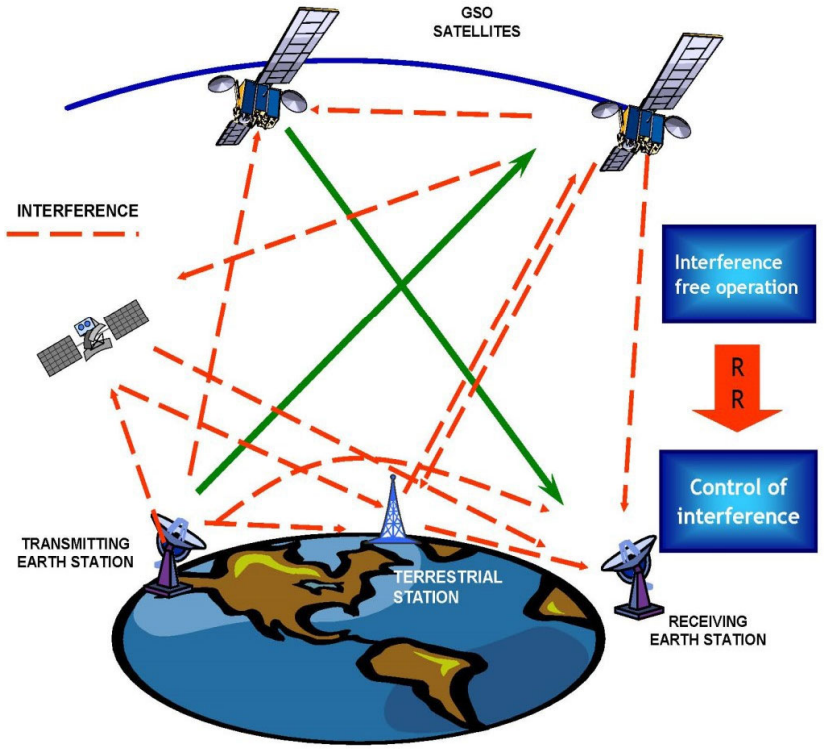
Space Services Department (SSD)

Coordination and recording procedures for space systems & earth stations:

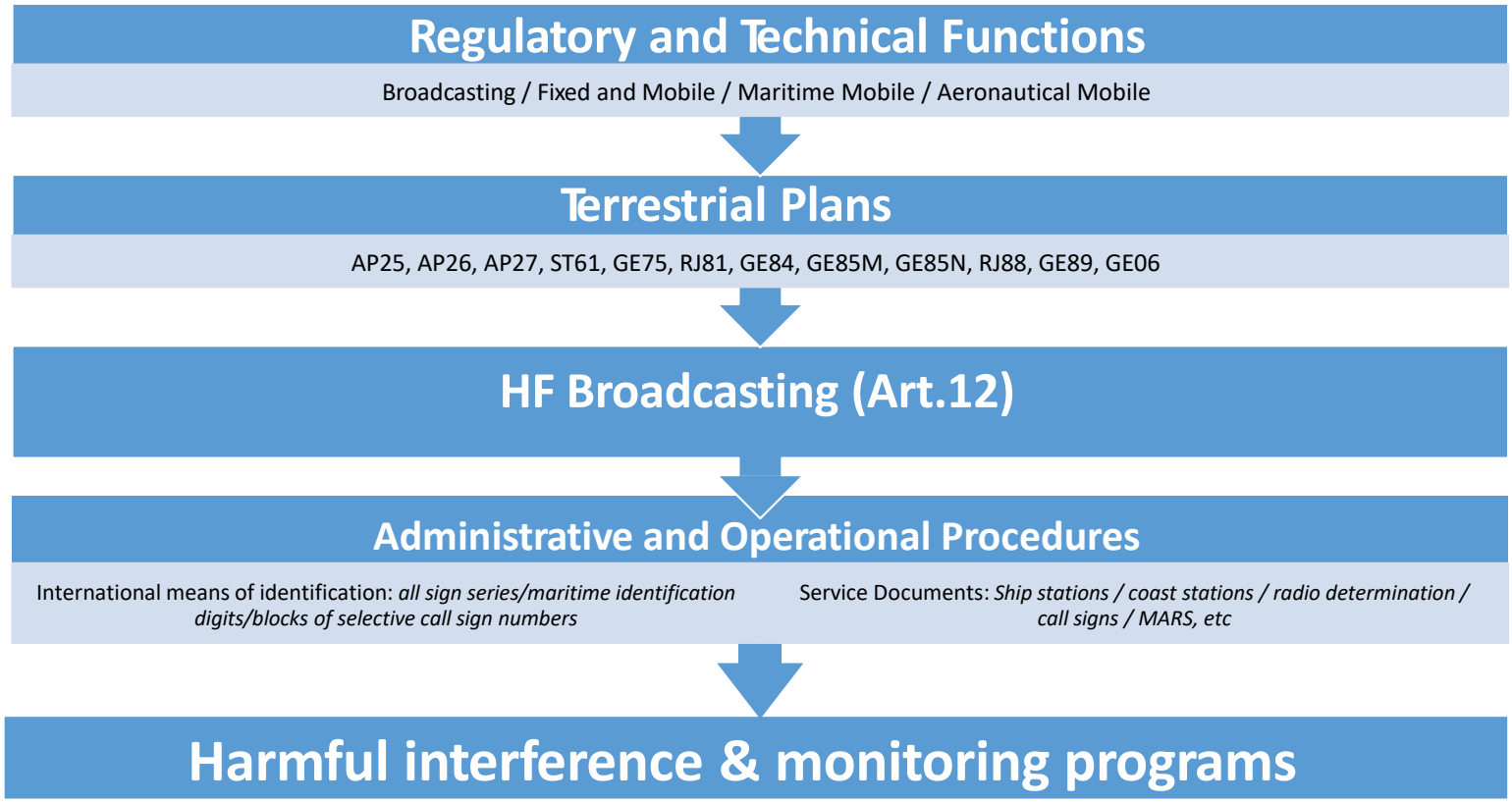
capture, processing and publication of data and examination of frequency assignment notices submitted by administrations for inclusion in the formal coordination procedures or recording in the Master International Frequency Register (MIFR).

Procedures for space related assignment or allotment *plans*

Assistance to administrations on all of the above issues



Terrestrial Services Department (TSD)



Study Groups Department (SGD)

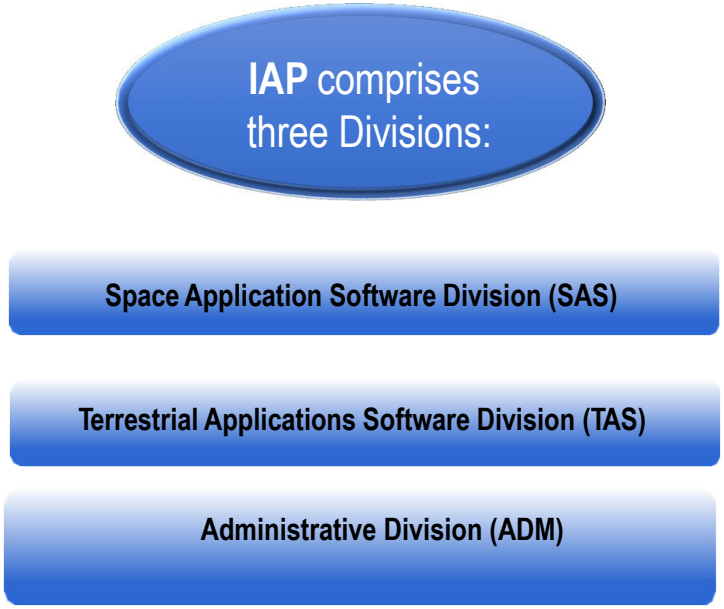
Activities include:

- Providing Counsellors who assist the Chairs of ITU-R Study Groups and Working Parties in the conduct of their meetings
- All secretariat support for the ITU-R Study Groups and their Working Parties
- Organization of Inter-regional Workshops in preparation for WRCs
- Organizes and supports holding of RAs and CPMs
- Capacity-building activities, including supporting the regional preparatory activities for RAs and WRCs

Informatics, Administration and Publications (IAP) Department

IAP undertakes activities related to:

- Development and enhancement of the Bureau's major software packages (automation tools and IT resources
- ITU-R Publications
- Membership and outreach in coordination with the General Secretariat and other Bureaux
- BR Administrative functions, including organization and support of ITU-R conferences and meetings



World & Regional Radiocommunication Seminars (WRS/RRS)

ITU RADIO-COMMUNICATION SECTOR

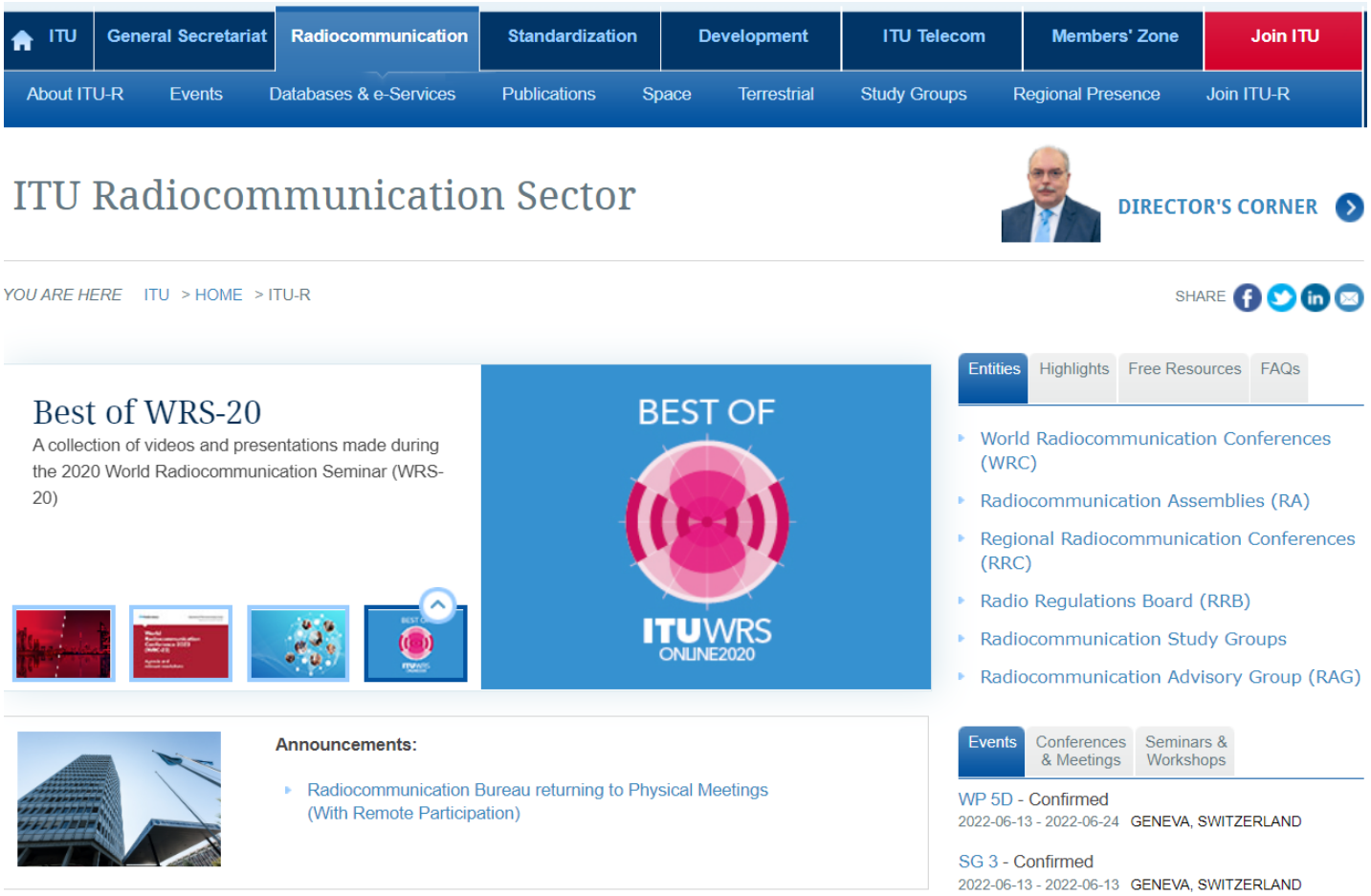
Disseminates worldwide the most recent revision of the **Radio Regulations** and the associated **RoP**

Fosters **human capacity building** on the use of the radio-frequency spectrum and the satellite orbits, particularly the application of the provisions of the ITU Radio Regulations

Complemented with sessions dedicated to spectrum-related **topics of particular interest** to the involved **region**.

Hosted by the spectrum management authorities in cooperation with the relevant regional organizations and the ITU regional/areas offices

ITU-R main Webpage (www.itu.int/itu-r)



Thank you!

ITU – Radiocommunication Bureau

Questions to brmail@itu.int

Other information

The society benefits daily of the ITU-R Activities

Emergency

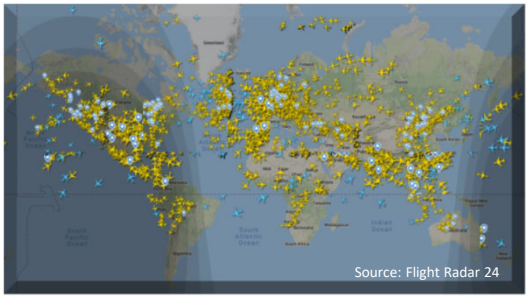
- ✓ Public Protection and Disaster Relief (PPDR)
- ✓ Climate change
- ✓ Search and rescue

Mobile

- ✓ IMT systems and applications (4G, 5G…)
- ✓ Industry applications
- ✓ Mobile communications
- ✓ Short-range devices
- ✓ Cognitive radio systems

Aeronautical

- ✓ Global Flight Tracking (GFT)
- ✓ Wireless Avionics Intra-Communications (WAIC)
- ✓ Unmanned aircrafts
- ✓ Air traffic control management
- ✓ Sub-orbital vehicles



Terrestrial

- ✓ Intelligent transport systems
- ✓ Railways
- ✓ Smart sustainable cities
- ✓ Amateur services
- ✓ Wireless networks
- ✓ HAPS
- ✓ Internet of Things (IoT)

The society benefits daily of the ITU-R Activities (cont'd)

Satellite

- ✓ Broadband connectivity (HTS, ESIMs, VSAT, etc.)
- ✓ GSO and non-GSO satellite systems
- ✓ Global Radionavigation Satellite Systems (GNSS)

Broadcasting

- ✓ Global advanced standards for television
- ✓ Accessibility to broadcasting services for persons with disabilities

Maritime

- ✓ Safety of life at the sea
- ✓ Global Maritime Distress and Safety System (GMDSS)
- ✓ Digital Selective-Calling (DSC) system

Science

- ✓ Radioastronomy
- ✓ Earth and meteorological observation
- ✓ Space research
- ✓ Time signals, time scales and timing applications

ITU-R committed to achieving the SDGs

ITU-R and WRCs develop the technical and regulatory frameworks for the sustainable development and protection of radiocommunication services and applications.

In response to Resolution ITU-R 61-2 *"ITU-R's contribution in implementing the outcomes of the World Summit on the Information Society and the 2030 Agenda for Sustainable Development"*, the Radiocommunication Bureau continues to work on WSIS implementation and follow-up activities within its mandate as well as in achieving the Sustainable Development Goals (SDGs).

In this regard:

A list of ITU-R publications directly relevant to the specific SDGs has been made available online and it is regularly updated.

ITU Leadership

Houlin Zhao
ITU Secretary General

Committed to Connecting the World

Malcolm Johnson
ITU Deputy Secretary General

ITU Telecommunication Standardization Sector

Committed to Connecting the World

KEY ROLE

Crucial role in **defining operation and interoperability of technologies** that underpin global communications network

200 - 300 new global standards approved every year, with over **4,000** in use today

Standards enable global communications by ensuring ICT networks and devices **speak the same language globally.**

Chaesub Lee, Director
ITU Telecommunication
Standardization Bureau

ITU Telecommunication Development Sector

Committed to Connecting the World

KEY ROLE

Spread equitable and affordable **access to telecommunications** to help stimulate social and economic development

Human capacity-building in developing and least developed countries (LDCs)

Helps to ensure that people everywhere are empowered **to reap the benefits that connectivity delivers**

Doreen Bogdan-Martin, Director
ITU Development Bureau

Major Achievements

ITU RADIO-COMMUNICATION SECTOR

1906:	First Radio Regulations treaty
1912:	Frequencies for maritime distress signals (SOS) & Morse Code
1959:	Allocations for Space Research & Radio Astronomy
1964/66:	Allotment plan for aeronautical mobile (R) service.
1994:	Digital Audio Broadcasting (DAB) standard;
1995/97:	Global framework for non-geostationary satellites
2000:	Specifications for IMT-2000 (3G)
2012:	Specifications for IMT-Advanced (4G)
2015:	Allocates bands for global flight tracking
2019:	Framework for regulating large NGSO constellations
2020:	Specifications for IMT-2020 (5G)