

ITUEvents

# ITU World Radiocommunication Seminar 2018

3-7 December 2018  
Geneva, Switzerland

[www.itu.int/go/ITU-R/WRS-18](http://www.itu.int/go/ITU-R/WRS-18)



## ITU-R Study Groups

BR Study Groups Department  
Philippe AUBINEAU (Acting Chief)  
David BOTHA



# International spectrum management framework

ITU Constitution,  
Convention

Plenipot

High level principles,  
rights and obligations

Radio Regulations  
Bi/multilateral Agreements

WRC  
RRC  
RRB

Table of Frequency Allocations  
Satellite orbit/terrestrial Plans  
Interference thresholds  
Frequency coordination  
Frequency registration  
Emergency procedures  
Rules of Procedure...

ITU-R Recommendations

RA

ITU-R Reports,  
Handbooks, software tools

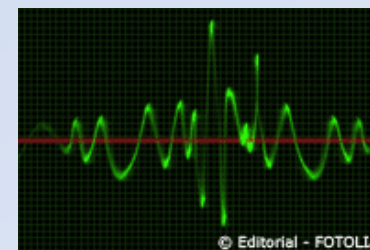
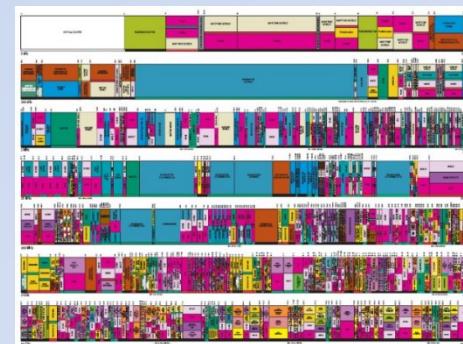
Study Groups  
WPs, TGs

Technical characteristics  
Sharing criteria/assessment  
Spectrum management  
Operational aspects ...

# Study Group 1

## Spectrum management

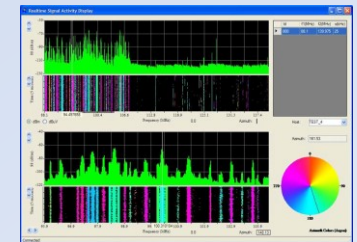
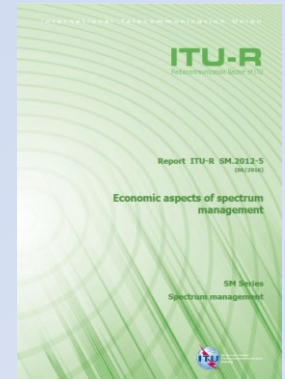
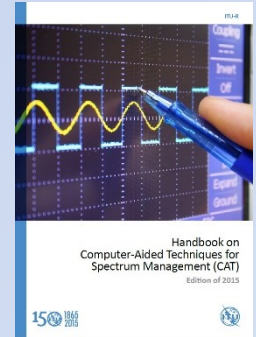
- Spectrum management  
-principles and techniques
- General principles of sharing
- Spectrum monitoring
- Long-term strategies for spectrum utilization
- Economic approaches to national spectrum management



Chairman: Mr Sergey PASTUKH  
Counsellor: Mr Philippe AUBINEAU

# Study Group 1 Working Parties

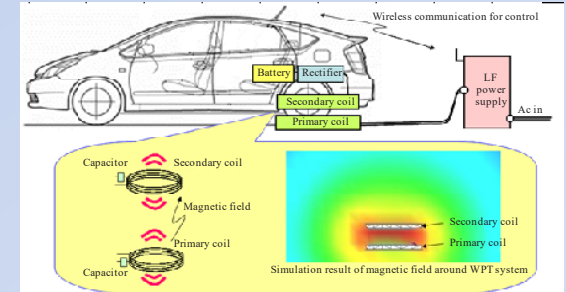
- **Working Party 1A (WP 1A)** - Spectrum engineering techniques
- **Working Party 1B (WP 1B)** - Spectrum management methodologies and economic strategies
- **Working Party 1C (WP 1C)** - Spectrum monitoring



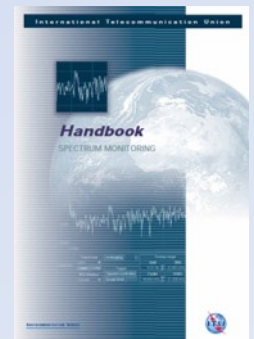
# Study Group 1

## Some topics of particular interest

- Wireless Power Transmission (incl. for Electric Vehicle)
- Harmonization for short-range devices (incl. UWB, RFID)
- Performance evaluation of Mobile DF units
- Electromagnetic field measurements to assess human exposure



Report SM2303-3-07

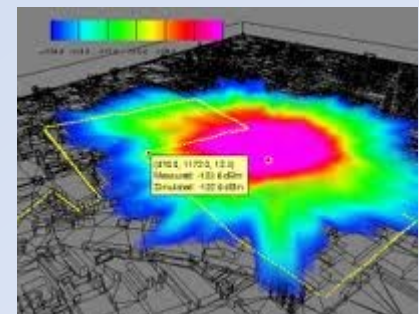
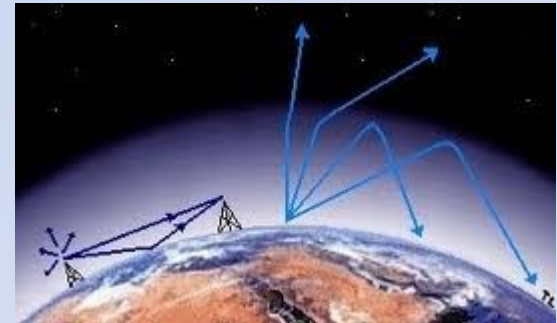


# Study Group 3

## Radiowave propagation

- Propagation in ionized and non-ionized media
- Point-to-point, point-to-area and Earth-space propagation
- Modelling and development of prediction methods
- Radio noise

Chairman: Mrs Carol WILSON  
Counsellor: Mr David BOTHA

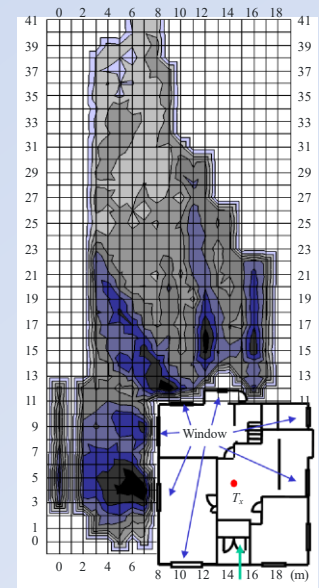
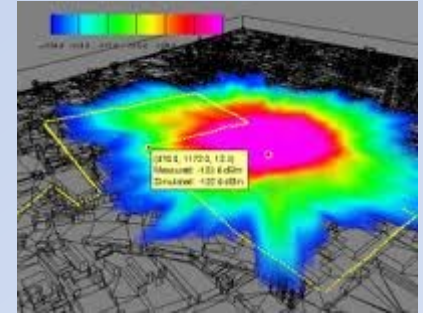


# Study Group 3 Working Parties

- **Working Party 3J (WP 3J)** - Propagation fundamentals
- **Working Party 3K (WP 3K)** - Point-to-area propagation
- **Working Party 3L (WP 3L)** - Ionospheric propagation and radio noise
- **Working Party 3M (WP 3M)** - Point-to-point and Earth-space propagation

# Topics of particular interest in Study Group 3

- Propagation models for sharing studies between IMT and incumbent services in bands in the range 24.25-86 GHz (WRC-19 AI 1.13)
- Propagation models in the range 275-450 GHz for sharing and compatibility studies between the land-mobile, fixed and passive services (WRC-19 AI 1.15)
- Building entry loss models





# Study Group 4

## Satellite services

- Systems, air interfaces and performance in FSS, BSS, MSS and RDSS
- Efficient orbit/spectrum utilization for FSS, BSS, MSS and RDSS
- IP global broadband Internet access via satellite
- Integration of satellite systems into Next Generation Access Technologies (5G)
- Early warning and relief operations
- Systems and networks in the RNSS

Chairman: Mr Chris HOFER

Counsellor: Mr Nelson MALAGUTI



# Study Group 4 Working Parties

- **Working Party 4A (WP 4A)** - Efficient orbit/spectrum utilization for FSS and BSS
- **Working Party 4B (WP 4B)** - Systems, air interfaces, performance and availability objectives for FSS, BSS and MSS, including IP-based applications and satellite news gathering
- **Working Party 4C (WP 4C)** – Efficient orbit/spectrum utilization for MSS and RDSS

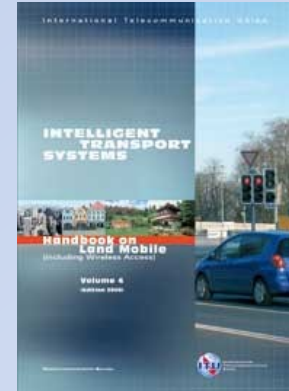
# Topics of particular interest in Study Group 4

- Use of the frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) by earth stations in motion (ESIM) communicating with geostationary space stations in the fixed-satellite service
- Technical, operational issues and regulatory provisions for non-geostationary fixed-satellite service satellite systems in the frequency bands 37.5-39.5 GHz (space to-Earth), 39.5 - 42.5 GHz (space to-Earth), 47.2-50.2 GHz (Earth to-space) and 50.4-51.4 GHz (Earth-to-space)



# Study Group 5

## Terrestrial services



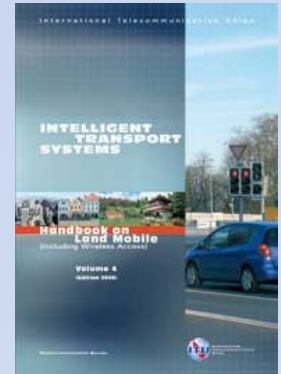
- IMT-2000, IMT-Advanced and IMT-2020
- Fixed, mobile, portable and nomadic communications, including BWA, RLANs, HAPS, ITS
- Radiodetermination service
- Maritime and aeronautical services
- Amateur service
- SDR and CRs



Chairman: Mr Martin FENTON  
Counsellor: Mr Sergio BUONOMO

# Study Group 5 Working Parties and Task Group

- **Working Party 5A (WP 5A)** - Land mobile service above 30 MHz (excluding IMT); wireless access in the fixed service; amateur and amateur-satellite services
- **Working Party 5B (WP 5B)** - Maritime mobile service including Global Maritime Distress and Safety System (GMDSS); aeronautical mobile service and radiodetermination service (Counsellor: Mr. Vadim Nozdrin)
- **Working Party 5C (WP 5C)** - Fixed wireless systems; HF and other systems below 30 MHz in the fixed and land mobile services
- **Working Party 5D (WP 5D)** - IMT systems
- **Task Group 5/1 (TG 5/1)** - WRC-19 agenda item 1.13



# Topics of particular interest in Study Group 5

- Detailed investigation, production and approval of the key elements of **IMT-2020** are well underway.
  - IMT provides the global platform on which to build the next generations of mobile broadband connectivity
- Internet of Things (IoT) - ITU-R is studying Machine Type Communications in IoT to be connected through IMT networks, dedicated networks and short range radio devices (SRDs)
  - AI will contribute in processing and analysis of big data generated by IoT
  - IoT will be the main part of massive data availability which is an important contributor to AI
- Intelligent Transport Systems (ITS) - ITU-R developed several outputs on ITS connectivity and advanced ITS radiocommunications - a key enabler of self-driving cars
  - AI will contribute in the analysis of ITS data for vehicle control and traffic prediction - Self-driving cars will be one of the main AI applications

# Study Group 6

## Broadcasting service

The broadcasting chain, end-to-end

- Programme production
- Programme assembly
- Terrestrial delivery

Chairman: Dr Yukihiro NISHIDA  
Counsellor: Mr Ruoting CHANG



# Study Group 6 Working Parties

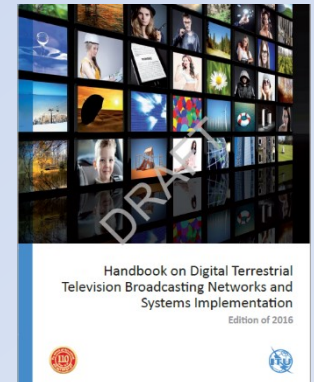
- **Working Party 6A (WP 6A)** - Terrestrial broadcasting delivery
- **Working Party 6B (WP 6B)** - Broadcast service assembly and access
- **Working Party 6C (WP 6C)** - Programme production and quality assessment



# The New ITU Handbook on DTTB networks and systems implementation

it includes all the important developments in the last 15 years:

- RRC-06 - Geneva Agreement GE06;
- WRCs Decisions - additional allocations to the mobile service and reduction of the Broadcasting Service bands;
- New audio-visual formats (HDTV, UHD TV, immersive sound);
- Progress in compression techniques;
- New multiplexing techniques (MMT);
- 2nd generation digital modulation technologies;
- Numerous new DTTB systems;
- Developments in IBB (Integrated Broadcast-Broadband) systems;
- Progress in accessibility services.



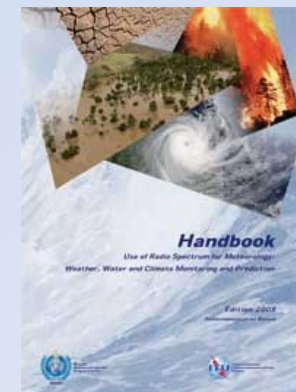
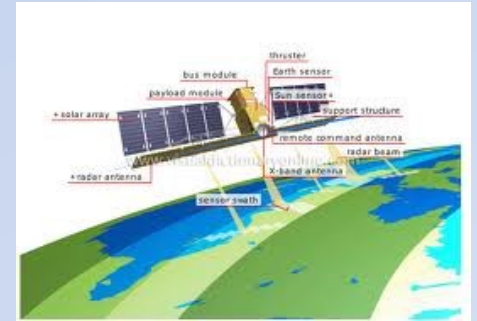
Draft approved in Oct 16, (see Doc. [6/74](#)),

The new Handbook compliments the earlier published [ITU-R Handbook on Digital terrestrial television broadcasting in the VHF/UHF bands](#) as well as the [ITU-D Guidelines for the transition from analogue to digital broadcasting](#)

# Study Group 7

## Science services

- Systems for space operation, space research, Earth exploration and meteorology
- Radio astronomy
- Standard frequency and time signals



Chairman: Mr John ZUZEK

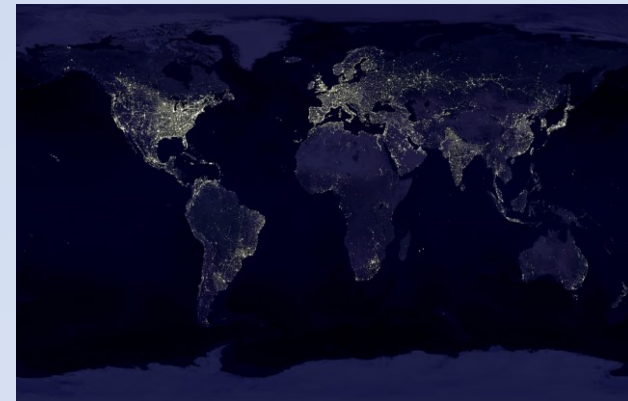
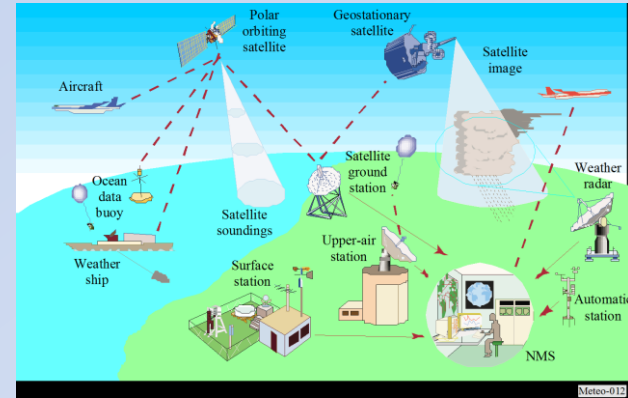
Counsellor: Mr Vadim NOZDRIN

# Study Group 7 Working Parties

- **Working Party 7A (WP 7A)** - Time signals and frequency standard emissions: Systems and applications (terrestrial and satellite) for dissemination of standard time and frequency signals
- **Working Party 7B (WP 7B)** - Space radiocommunication applications: Systems for transmission/reception of telecommand, tracking and telemetry data for space operation, space research, Earth exploration-satellite, and meteorological satellite services
- **Working Party 7C (WP 7C)** - Remote sensing systems: active and passive remote sensing applications in the Earth exploration-satellite service and systems of the MetAids service, as well as space research sensors, including planetary sensors
- **Working Party 7D (WP 7D)** - Radio astronomy: radio astronomy and radar astronomy sensors, both Earth-based and space-based, including space very long baseline interferometry (VLBI)

# Topics of particular interest in Study Group 7

- Preserving spectrum for operation and development of meteorological applications
- timely warning of impending natural disasters, accurate climate prediction, the status of global water and bio resources – in support of the [Sustainable Development Goals](#)
- Revision of joint ITU/WMO Handbook “Use of Radio Spectrum for Meteorology”



# Coordination Committee for Vocabulary (CCV)

Coordination and approval of, in close collaboration with the Radiocommunication Study Groups, the General Secretariat (Conferences and Publications Department) and other interested organizations (mainly the International Electrotechnical Commission (IEC)) :

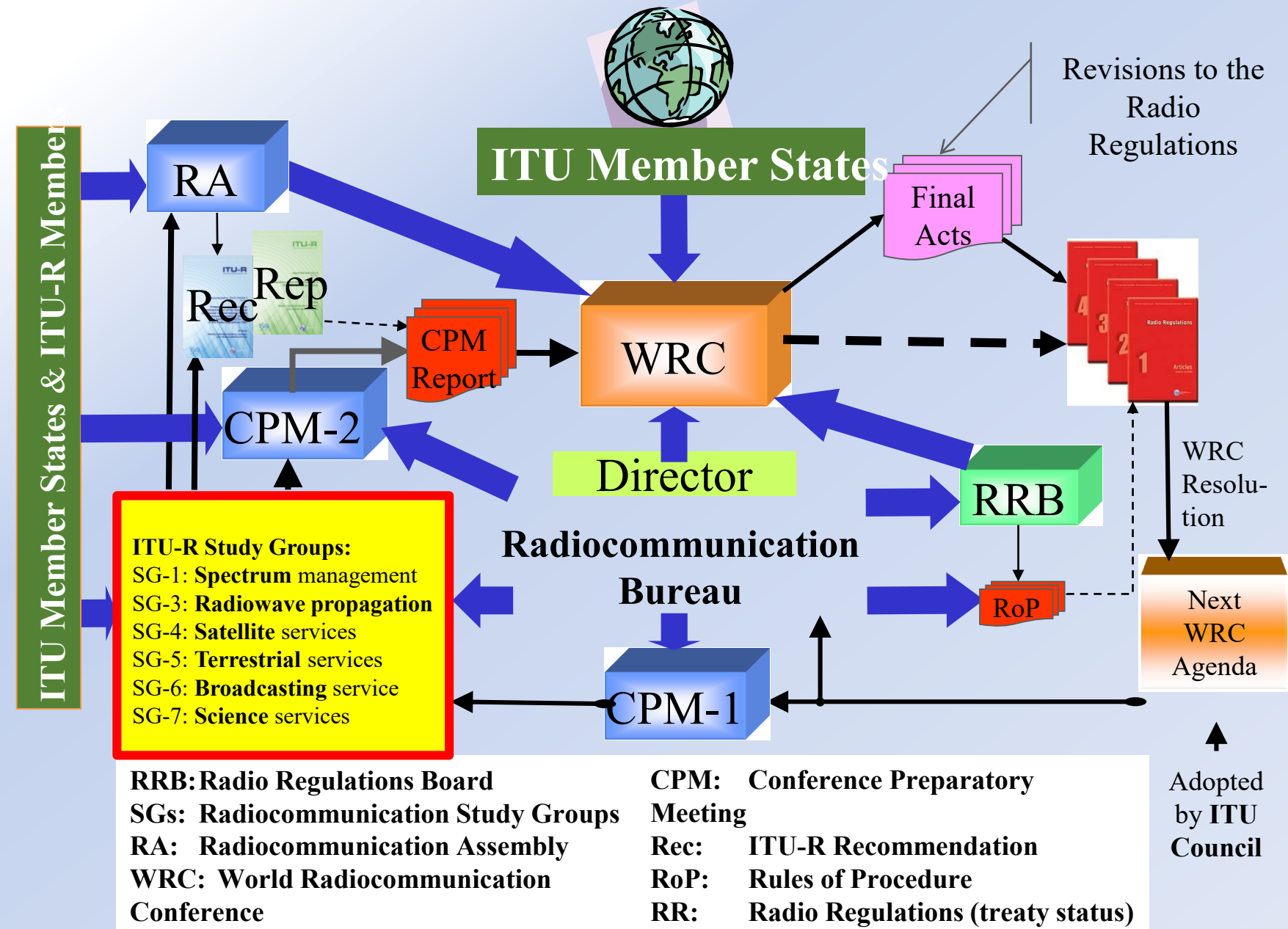
- vocabulary, including abbreviations and initials;
- related subjects (quantities and units, graphical and letter symbols).

The terminology managed by the Radiocommunication Sector is included in the database “ITU Terms and Definitions” ([www.itu.int/ITU-R/go/terminology-database](http://www.itu.int/ITU-R/go/terminology-database)).

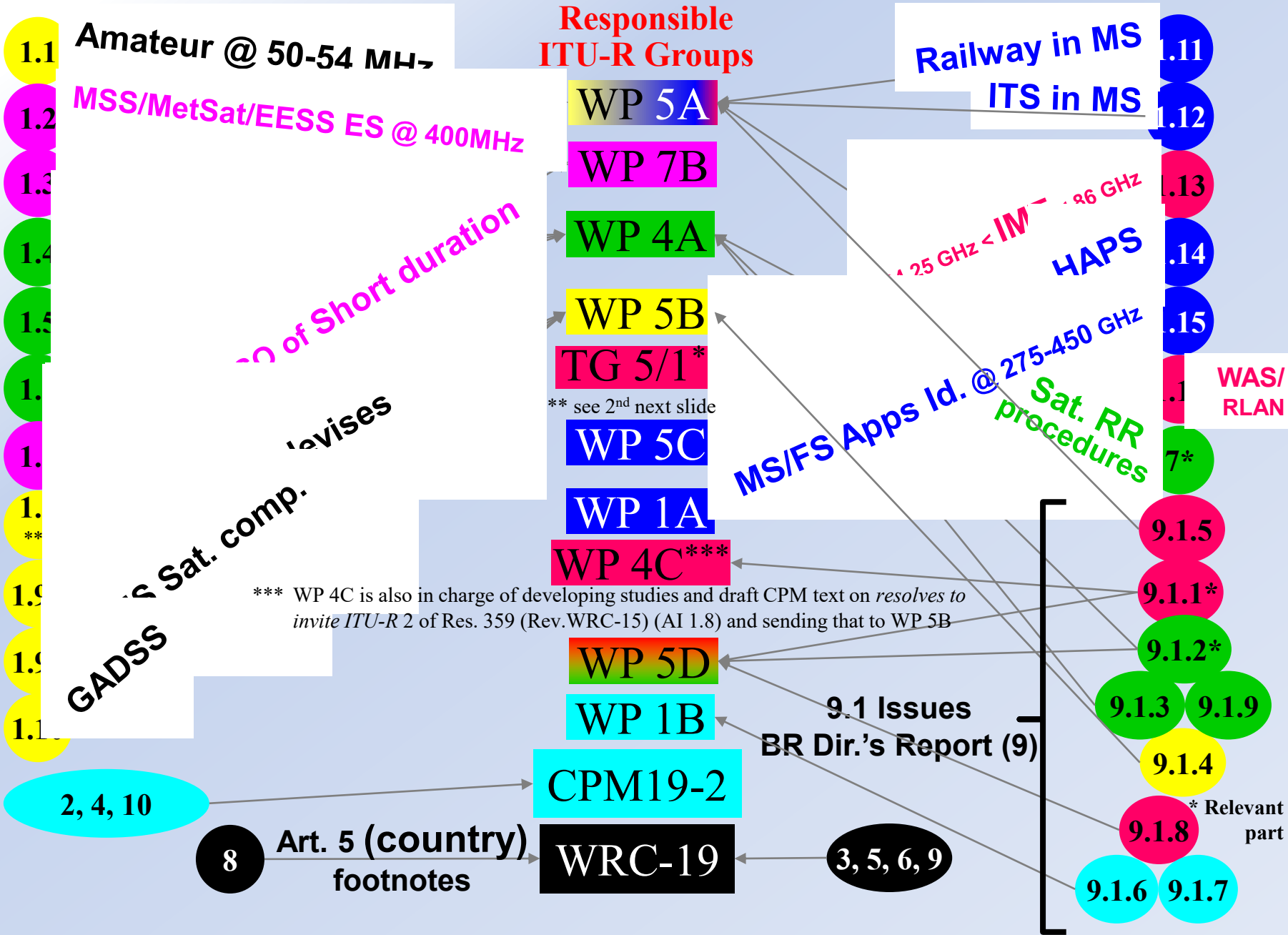
Chairman: Mr Christian RISSONE

Counsellor: Mr Nelson MALAGUTI

# Study groups in the WRC process



# WRC-19 agenda items & Resp. Groups



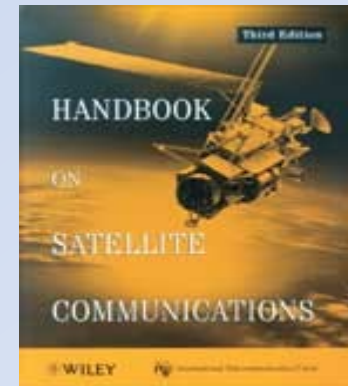
# ITU-R publication series

- [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](#) Mobile, radiodetermination, amateur and related satellite services
- [P](#) Radiowave propagation
- [RA](#) Radio astronomy
- [RS](#) Remote sensing systems
- [S](#) Fixed-satellite service      [SNG](#) Satellite news gathering
- [SA](#) Space applications and meteorology
- [SF](#) Frequency sharing & coordination between fixed-satellite & fixed service systems
- [SM](#) Spectrum management
- [TF](#) Time signals and frequency standards emissions
- [V](#) Vocabulary and related subjects



# Study Group Products

- ITU-R Recommendations
- Reports and Handbooks
- Technical bases for radio conferences





**Thank you!**