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## **ITU-R Study Groups**

Colin Langtry  
Chief  
BR Study Groups Department

# 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

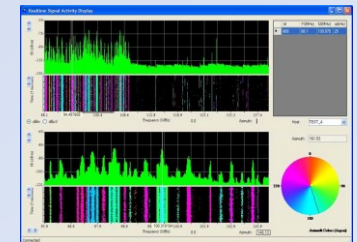
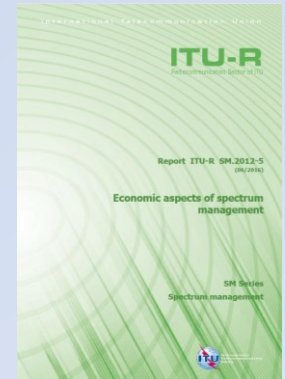
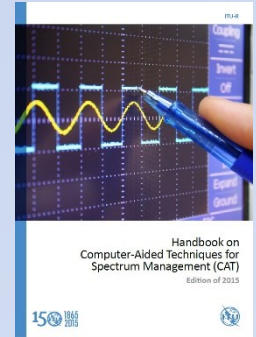


Chairman: Mr. Sergey PASTUKH

Counsellor: Mr. Philippe AUBINEAU

# Study Group 1 Working Parties

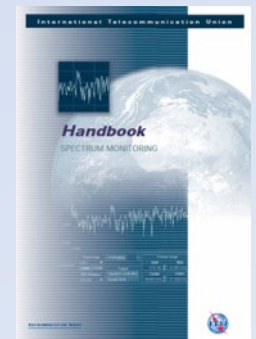
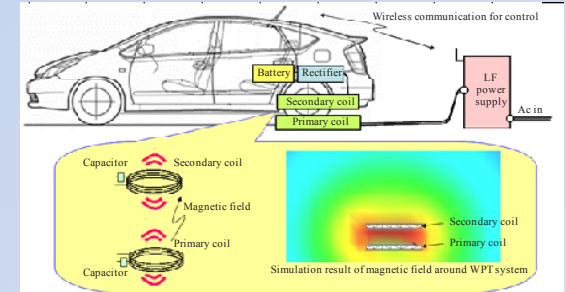
- **Working Party 1A (WP 1A)** - Spectrum engineering techniques
- **Working Party 1B (WP 1B)** - Spectrum management methodologies and economic strategies
- **Working Party 1C (WP 1C)** - Spectrum monitoring



# 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

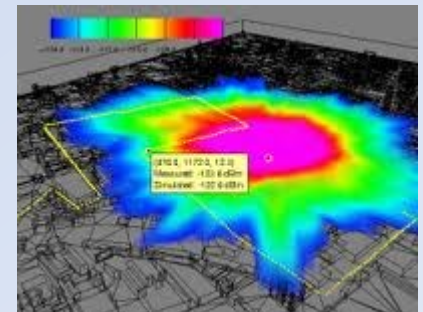
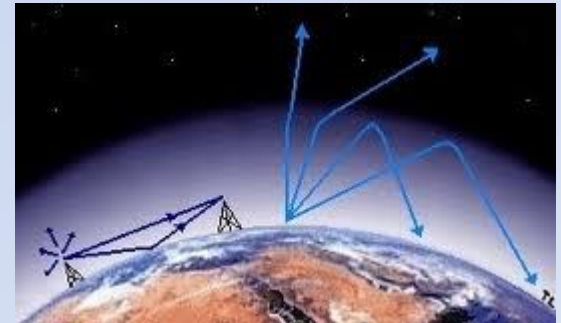
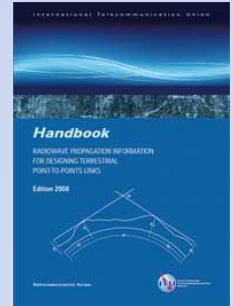


# Study Group 3

## 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

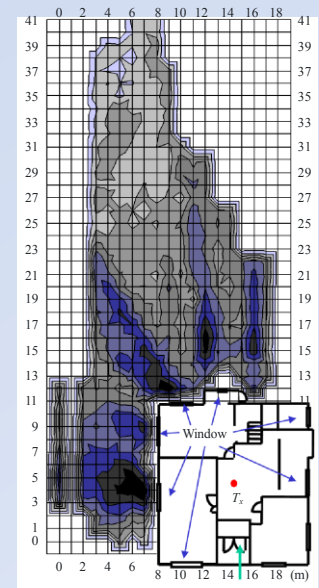
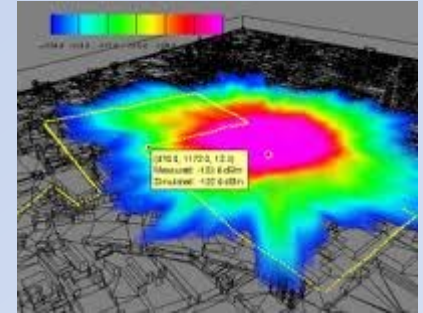


# Study Group 3 Working Parties

- **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
- 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

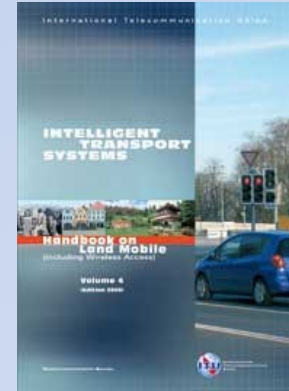
# Topics of particular interest in Study Group 4

- 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



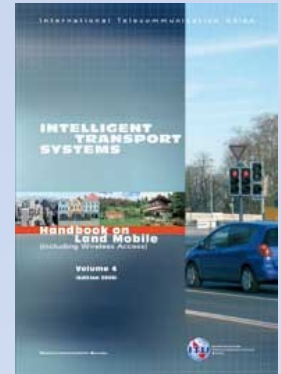
- IMT-2000, IMT-Advanced and IMT-2020
- Fixed, mobile, portable and nomadic communications, including BWA, RLANs, HAPS, ITS
- Radiodetermination service
- Maritime and aeronautical services
- Amateur service
- SDR and CRs



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 (Counsellor: Mr. David Botha)

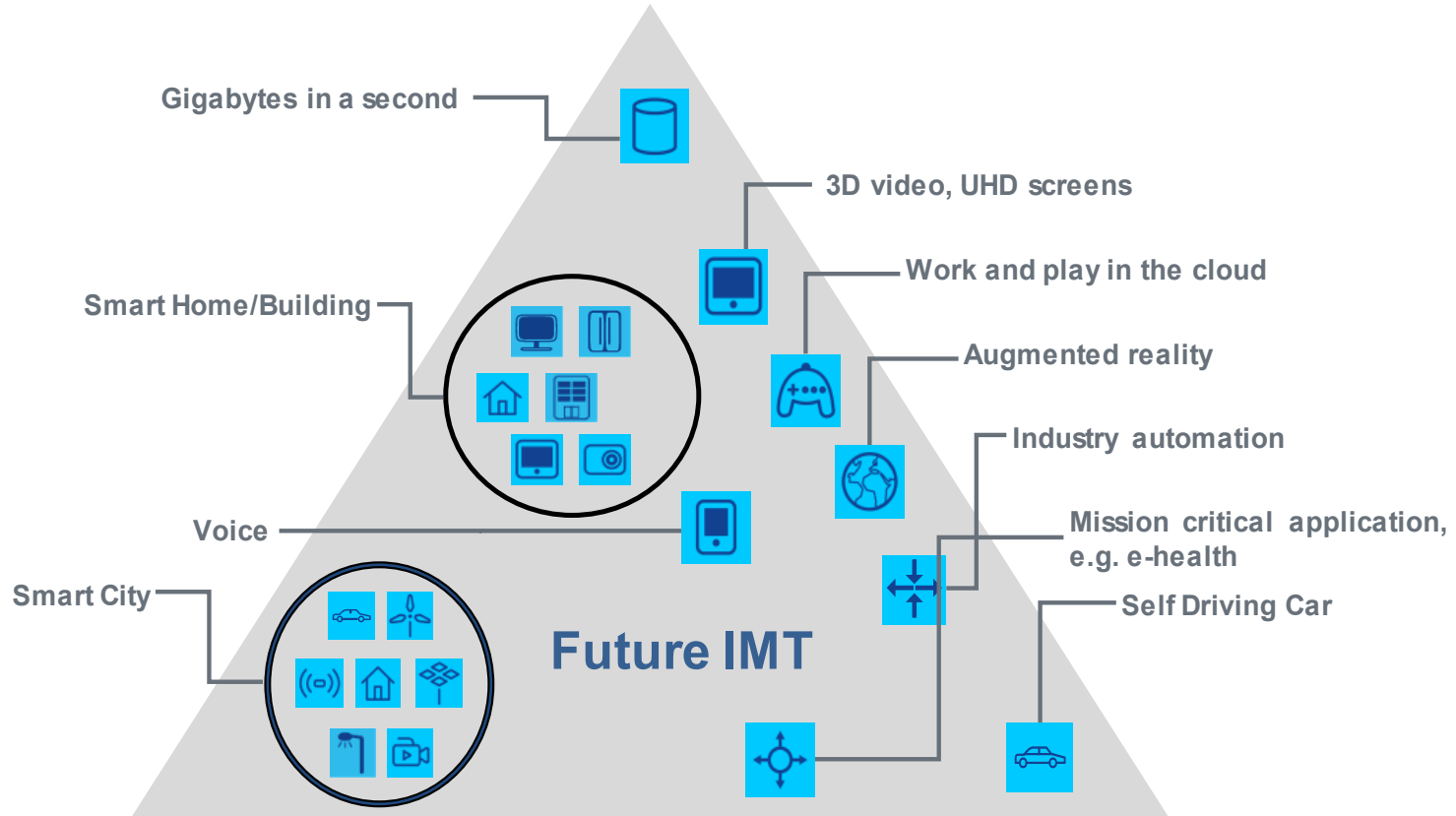


# IMT-2000, IMT-Advanced, IMT-2020

- All 3G and 4G mobile broadband systems are based on the ITU's IMT standards.
- ITU established the detailed specifications for **IMT-2000** and the first 3G deployments commenced around the year 2000.
- In January 2012, ITU defined the next big leap forward with 4G wireless cellular technology – **IMT-Advanced** – and this is now being progressively deployed worldwide.
- The detailed investigation of the key elements of **IMT-2020** are now well underway.
- IMT provides the global platform on which to build the next generations of mobile broadband connectivity

# IMT-2020 usage scenarios

## Enhanced Mobile Broadband



**Massive Machine Type Communications**

**Ultra-reliable and Low Latency Communications**

# Study Group 6

## Broadcasting service

The broadcasting chain, end-to-end

- Programme production
- Programme assembly
- Terrestrial delivery

Chairman: Dr. Yukihiro NISHIDA  
Counsellor: Mr. Pham HAI





# 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

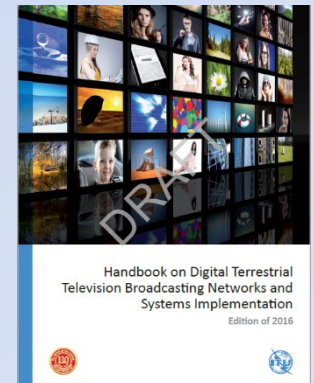
# The New ITU Handbook on DTTB networks and systems implementation

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, UHDTV, 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](#) ),

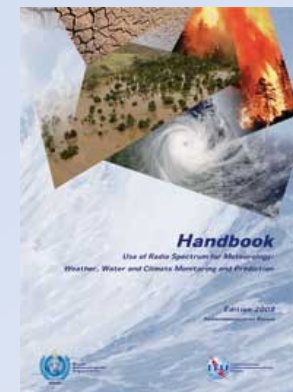
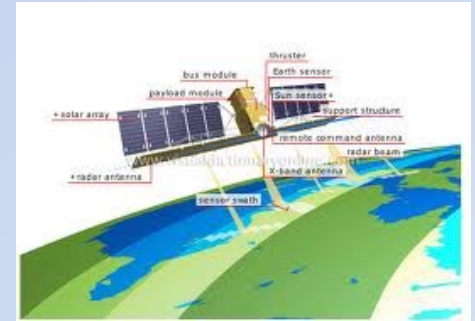
The new Handbook compliments the earlier published [ITU-R Handbook on Digital terrestrial television broadcasting in the VHF/UHF bands](#) as well as the [ITU-D Guidelines for the transition from analogue to digital broadcasting](#)



# 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

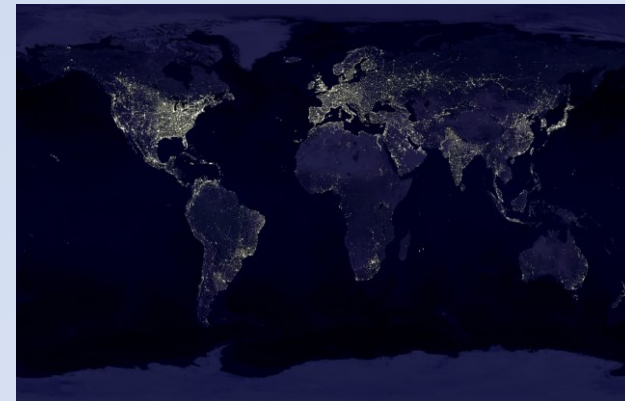
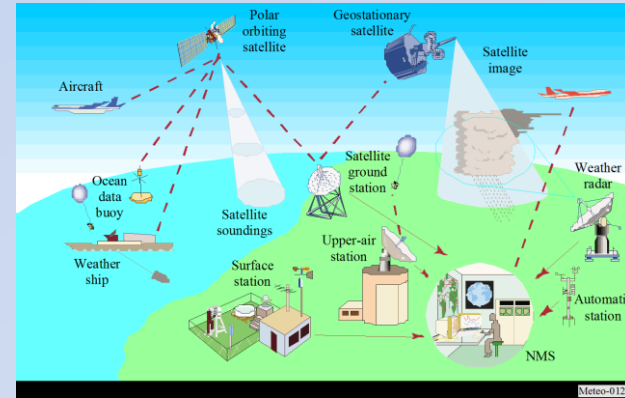
Counsellor: Mr. Vadim NOZDRIN

# 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).

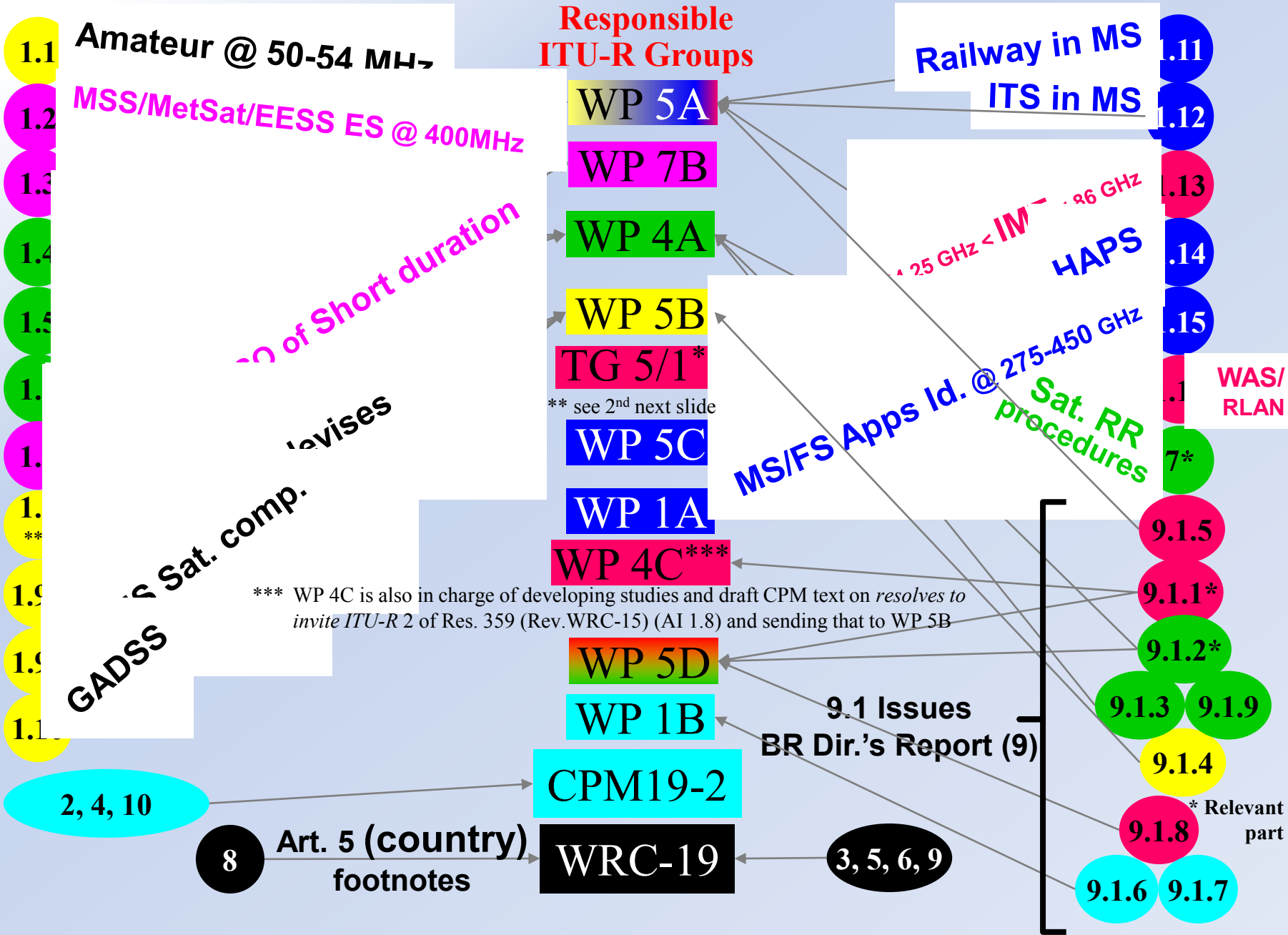
The terminology managed by the Radiocommunication Sector is included in the database “ITU Terms and Definitions” ([www.itu.int/ITU-R/go/terminology-database](http://www.itu.int/ITU-R/go/terminology-database)).

Chairman: Mr. Christian RISSONE

Counsellor: Mr. Nelson MALAGUTI



# WRC-19 agenda items & Resp. Groups





# Study Group 3 (SG 3)

YOU ARE HERE [HOME](#) > [ITU-R](#) > [STUDY GROUPS](#) > [SG 3](#)

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## Radiowave Propagation

Propagation of radio waves in ionized and non-ionized media and the characteristics of radio noise, for the purpose of improving radiocommunication systems.

[More >](#)

### Structure

- ▶ [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](#)

### Next meeting

- ▶ Thursday 2017-03-30
- ▶ Place : **Switzerland [Geneva]**
- ▶ Status : **Confirmed** - [Add to Calendar](#)
- ▶ Invitation
- ▶ List of Registered Participants [TIES](#)

- ▶ Registration
- ▶ SG3 meetings Sharepoint site [TIES](#)

### Documents

- ▶ Contributions "as received" [TIES](#)
- ▶ Contributions [S](#) [TIES](#) - Template
- ▶ Study Group 3 Summary Record [TIES](#)  
(Meeting: 2016-06-30)
- ▶ Administrative Documents (ADM) [TIES](#)
- ▶ Information Documents (INFO) [TIES](#)
- ▶ Temporary Documents (DT)
- ▶ Informal documents on Sharepoint [TIES](#)
- ▶ ITU-R Documents Search Tool

### Meetings and Events

### Related activities

### Highlights

- ▶ [ITU-R Meeting schedule](#)
- ▶ [Meeting sessions](#)
- ▶ [ITU-R Event Registration and Practical Information](#)
- ▶ [SG 3 Workshop: Overview and Activities](#)

### References

### Related ITU-R Texts

### Circulars

- ▶ [Radio Regulations](#)
- ▶ [Working methods \(Resolution ITU-R 1\)](#)
- ▶ [Guidelines for the working methods](#)
- ▶ [Format of ITU-R Recommendations](#)
- ▶ [ITU Style Guides](#)
- ▶ [ITU Terms and Definitions Database](#)
- ▶ [Structure of Radiocommunication Study Groups \(Resolution ITU-R 4\)](#)
- ▶ [Liaison and collaboration with other relevant organizations \(Resolution ITU-R 9\)](#)

### Contacts

### Electronic working

### Intellectual Property Rights

# Access to documentation

- TIES (Telecom Information Exchange Services) accounts allow members to access restricted databases, documents and technical databases;
- All representatives of Member States, Sector Members, Associates and Academia are able to have with a TIES account

# On-line Registration to ITU-R Events

YOU ARE HERE [HOME](#) > [ITU-R](#) > [INFORMATION](#) > [ITU-R EVENTS](#) > [ON-LINE REGISTRATION TO ITU-R EVENTS](#)

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[ITU-R Event Registration and Practical Information](#)

[On-line Registration to ITU-R Events](#)

[Visa Support](#)

[ITU Geneva Premises](#)

[IT Facilities](#)

[Accommodation](#)

[Duty Free Shop and Petrol Card](#)

[ITU-R Activities and Upcoming Events](#)

[Contacts](#)

## On-Line Registration by Designated Focal Points

Each Member has been requested to designate a Focal Point (DFP) responsible for the handling of all registration formalities.

Each DFP has received a unique username and password providing access to the **ITU-R on-line event registration system**. After logging on to the system, the DFP will be requested to complete a registration form for each participant foreseen to represent his/her entity.

**DFPs should make sure they enter a valid e-mail address for each participant they register on-line.** A registration confirmation and important administrative information will be subsequently e-mailed directly to each registered participant.

[How can a DFP submit a visa support request on behalf of a meeting participant?](#)

**Advance on-line registration of all participants, via DFPs, is mandatory. The Radiocommunication Bureau**

## Designated Focal Points for ITU-R Activities

**i** [List of Designated Focal Points \(DFPs\) - ITU-R Activities](#) responsible for the handling of all registration formalities [English only].

## CONFIRMATION OF REGISTRATION

Upon completing the registration requests, registered participants will receive a personal e-mail confirmation containing important administrative information on the event. DFPs should make sure they enter a valid e-mail address for each participant they register on-line

### QUICK LINKS

**i** [List of Designated Focal Points \(DFPs\) - ITU-R Activities](#)

[ITU-R on-line event registration system](#) (access restricted to DFPs)

**i** A TIES account is required to view these sections. [Apply for a TIES account.](#)

[Upcoming Events](#)

[Today's Sessions](#)

[Circulars](#)



WRS-16 - Confirmed  
2016-12-12 - 2016-12-16 GENEVA, SWITZERLAND

110th anniversary of the ITU Radio Regulations (1906-2016) - Confirmed  
2016-12-12 - 2016-12-12 GENEVA, SWITZERLAND

CCV - Planned

# Participation

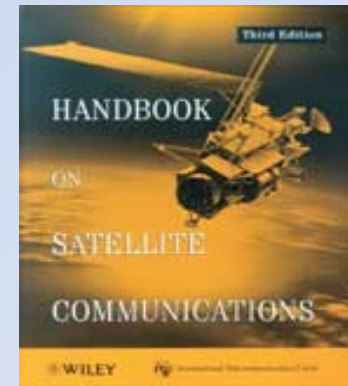
- Direct
- Remote
- Webcasts
- Correspondence groups

# Benefits

- Global standards – guaranteed performance, economies of scale – reduced costs, increased reliability, simplified coordination
- Unique forum to reach consensus amongst the broad range of stakeholders – 193 Member States, > 700 Sector Members, Associates and Academia representing equipment manufacturers, network operators, the scientific and research community
- On the cutting edge of technology development
- Make new contacts and meet with peers - share experience and find common solutions for spectrum management

# Study Group Products

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





**Thank you!**