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# Achieving efficient and effective spectrum utilisation

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**African Telecommunications Union**

# Achieving efficient and effective spectrum utilization

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# Outline

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1. Overview of ATU
2. The key elements for efficient and effective spectrum utilization
3. Harmonization, coordination and notification
4. Smart radiocommunication techniques and systems
5. Research and development
6. Smart use of the government agencies
7. Conclusion



# Overview of ATU

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- Established in **1977** in Kinshasa – DRC, as a **specialized agency of AOU** now AU in the area of telecommunications.
- Has **four** permanent organs:
  1. Plenipotentiaries Conference;
  2. Administrative Council;
  3. Technical and Development Conference, and
  4. General Secretariat (currently based in Nairobi – Kenya)
- Provides for non–permanent organs e.g. the newly established **AfriSWoG**
- Currently has **44 Member States** and **22 Associate Members**
- However, **all African countries** actively participate in ATU activities
- Increased partnerships: e.g. ISOC, African Institute
- Key programs: Policy and regulatory development and harmonization; Spectrum Management, Capacity building; ICT Infrastructure development; Preparatory work for International ICT conferences such as ITU PP–14, WTDC, WCIT, WRCs



# The key elements

for efficient and effective spectrum utilization

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1. Harmonization of (planned) use
2. Coordination of use
3. Notification of use
4. Clear written policy and legal
5. Smart and empowered regulator
6. Smart radiocommunication techniques and systems
7. Spectrum management systems
8. Research and development
9. Smart radio users
10. Smart use of spectrum by the government agencies



# Harmonization, coordination and notification

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## ▶ Harmonization of (planned) use, examples:

- Geneva 2006 Digital Terrestrial Television Plan
- The digital dividend spectrum in the range 694 – 862 MHz
- WRC-15 Agenda Item 1.1 (additional spectrum identification for IMT)

## ▶ Coordination of use example

- The GE06 frequency modification in ATU region in view of the second digital dividend in the range 694 – 790MHz

## ▶ Notification of use

- Notification of spectrum use to the ITU to facilitate planning and coordination



# Smart radiocommunication techniques and systems

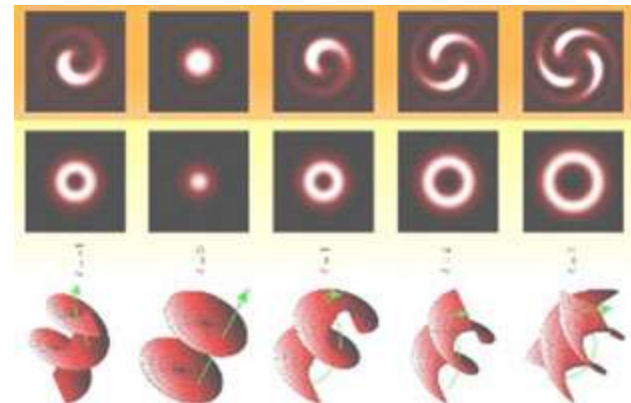
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- ▶ *Efficient spectrum utilization technologies such as **TV white space** via:*
  - **Software defined radios (SDR):** radio equipment employing a technology, which allows the setting or changing of technical parameters, including frequency range, modulation type and power, depending on the electromagnetic environment.
  - **Cognitive Radio Systems (CRS):** a radio system employing a technology, which makes it possible to obtain knowledge of its operational environment, policies and internal state, to dynamically adjust its parameters and protocols according to the knowledge obtained and to learn from the results obtained.



# Research and development

- ▶ *Discovery of new techniques of spectrum utilization example:*
  - Research of **Radio Orbital Angular Momentum** to radiocommunications by the University of Padua, Italy, has the potential for drastic improvement in spectrum efficiency
  - This research is investigating use of **9 more additional vectorial** quantities.
  - Until now **only one factorial quantity**, namely linear momentum, is currently used for radiocommunications



Source: <http://www.itu.int/en/ITU-R/Pages/default.aspx>



# Smart use of the government agencies

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- ▶ *Prudent spectrum utilization by the government agencies*
- It is acknowledged that use of the spectrum by the government is essential for security and other needs
- Government agencies to avoid excessive holding of spectrum (to acquire and use the spectrum bearing in mind that it has value)



# Conclusion

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1. **Harmonization is the key** to achieving efficient and effective spectrum utilization
2. Sub-regional, regional and the ITU should **make every effort** to achieve the **maximum harmonization possible**
3. Through the World Radio Communications Conferences (WRCs) of 2007 and 2012, we have seen a lot of **goodwill and progress towards harmonization**
4. WRC-15 is yet **another opportunity** for the regions and the world to continue more harmonization
5. The region of ATU is **ready to play its role** in this harmonization agenda





# thank you

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