

# **SPACE ACTIVITIES OF LUXEMBOURG**

**An Overview in Relation to the Application  
for Membership in the UN COPUOS**

# Structure

- I. Activities of Luxembourg in Space
- II. Space R & D Activities of Luxembourg
- III. Emergency.lu
- IV. University of Luxembourg
- V. Conclusion.



# I. Activities of Luxembourg in Space

## A. European Space Agency (ESA)



2000: Cooperation Agreement with the European Space Agency (ESA) to participate in the ARTES program

2005: Luxembourg becomes the 17<sup>th</sup> Member State of ESA

2008: First National Action Plan for Space R&D

2012 - 2015: Presidency of ESA (together with Switzerland)

## B. SES (Société Européenne des Satellites) **SES**<sup>^</sup>

World's second largest geostationary telecommunication satellites operator by revenue

1985: creation of Société Européenne des Satellites

1988: concession granted by the State of Luxembourg

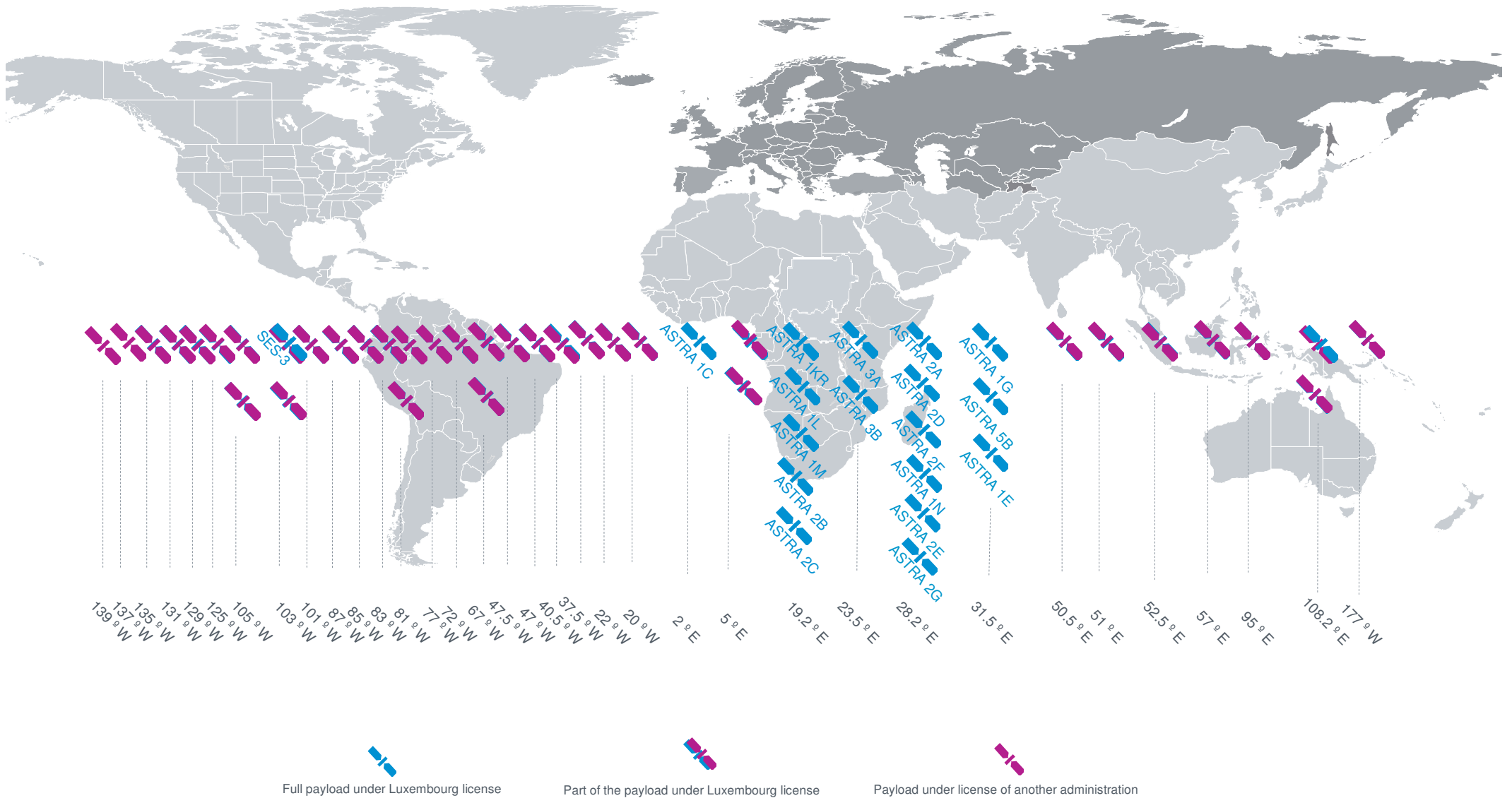
1988: first launch of a satellite - ASTRA 1A

2001 acquisition of GE Americom → SES Global

2006 acquisition of NewSkies

18 Luxembourgish geostationary communications satellites in orbit

# SES Full Payloads under Luxembourg License



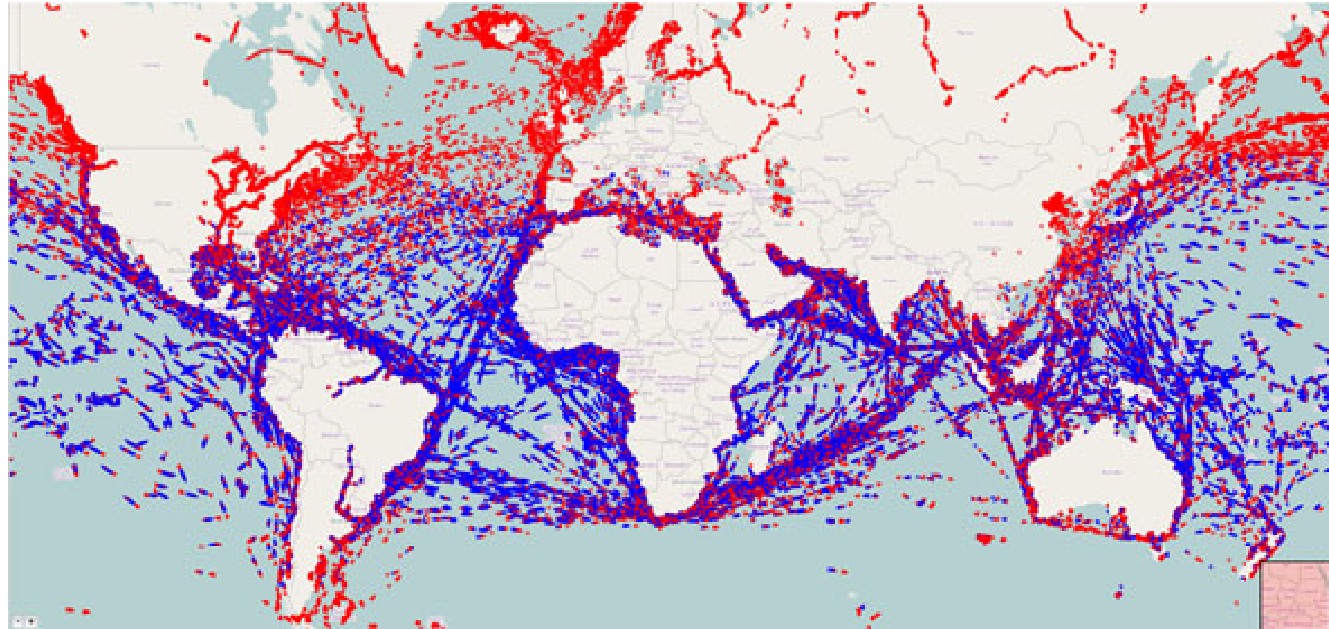
## C. LuxSpace



2 LEO microsattellites in orbit offering AIS (Automatic Identification System) services

2011: launched VesselSat 1

2012: launched VesselSat 2



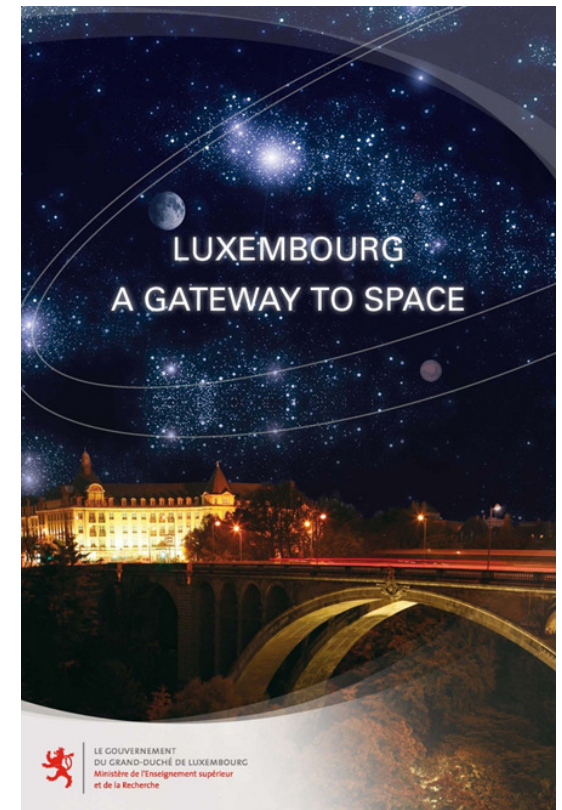
# II. Space R & D Activities of Luxembourg

## National Action Plan for Space R&D

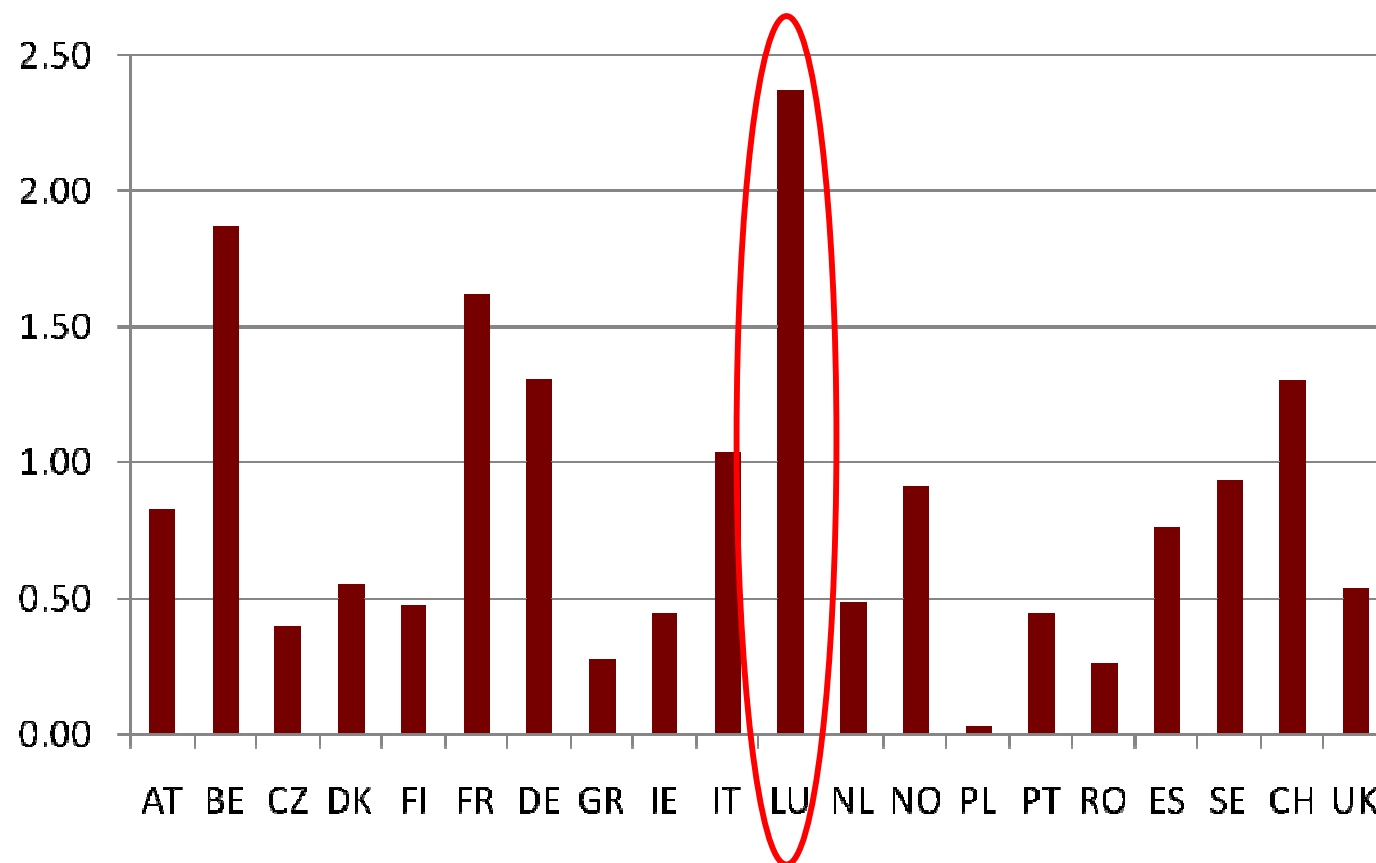
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Main implementation axes of the national strategy:

- ESA Programmes (85%)
  
- National Initiatives (11%):
  - LuxLAUNCH
  - LuxIMPULSE - National program managed by ESA
    - ❖ Technological developments
  - LuxYGT – program for Luxembourg graduates
  
- Bilateral and multilateral cooperation (4%)



## Space activities in Luxembourg and in Europe: Contributions 2012 in relative terms



<i>Portion of space activities in GDP</i>	<b>Luxembourg</b>	<b>European average</b>
<b>Space industry + satellite operators</b>	<b>4,3%</b>	<b>0,1%</b>
<b>Space industry (upstream)</b>	<b>0,02%</b>	<b>0,06%</b>

## Space R & D Assessment 2012 - Thematic priorities

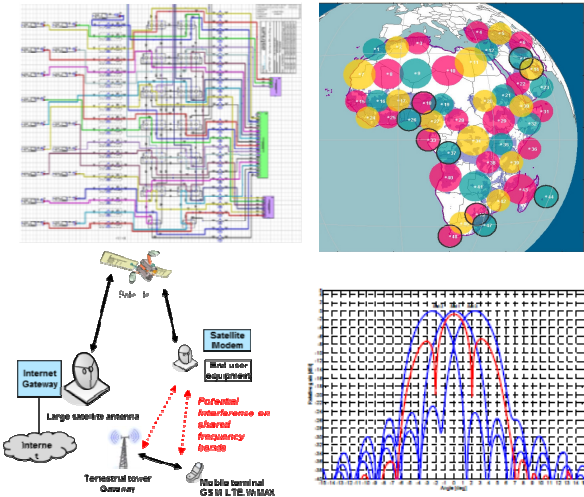
1. Value added services using satellite data & infrastructures
2. Ground equipment
  - Ka-band antenna; mechanical and electrical ground support equipment
3. Satellite equipment
  - Electric propulsion; structures
4. Microsatellites
  - Platform; payloads.



# SES Space R&D projects in Luxembourg

## ▲ Multiple developments with the University of Luxembourg and SnT (Interdisciplinary Centre for Security, Reliability and Trust)

1. Operations practices: payload optimizer and automated procedure conversion tool
2. Adaptive modem techniques for cognitive radio systems
3. Multicarrier digital equalization
4. Mobile applications / MIMO (Multiple-Input Multiple-Output) hardware demonstrator
5. Multiple LNB (end user antenna reception equipment)
6. Use of polarization as signaling dimension



## ▲ Electra – development of an all-electric satellite with the ESA and the Luxembourg ESA delegation

Goal: SES to develop, with ESA and OHB from Germany, a small satellite platform based solely on electric propulsion. Such a satellite platform would allow to drastically reduce the mass and the associated launch costs



# III. Emergency.lu

Task: to fill the communication gap in the first hours and days after a large-scale disaster

Deployments: Philippines, South Sudan, Mali and soon Nepal and Venezuela



*“The deployment of the global multi-layer telecommunications platform 'emergency.lu' is starting to be a vital leading-edge solution for the humanitarian community at large.[...] This system is going to save lives.”*

Josette Sheeran

Former Executive Director of the UN World Food Programme

*“I congratulate Luxembourg industry for such a creative solution.”*

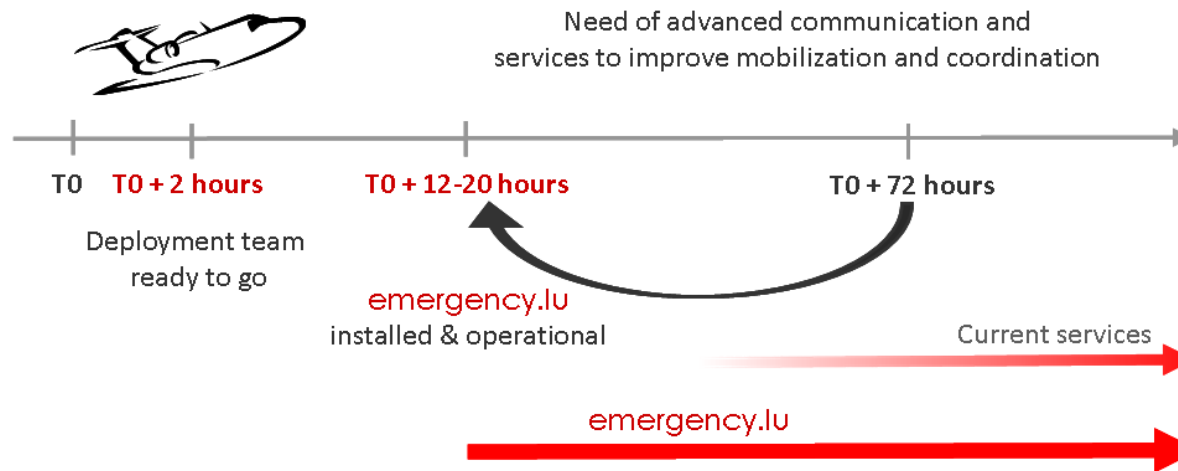
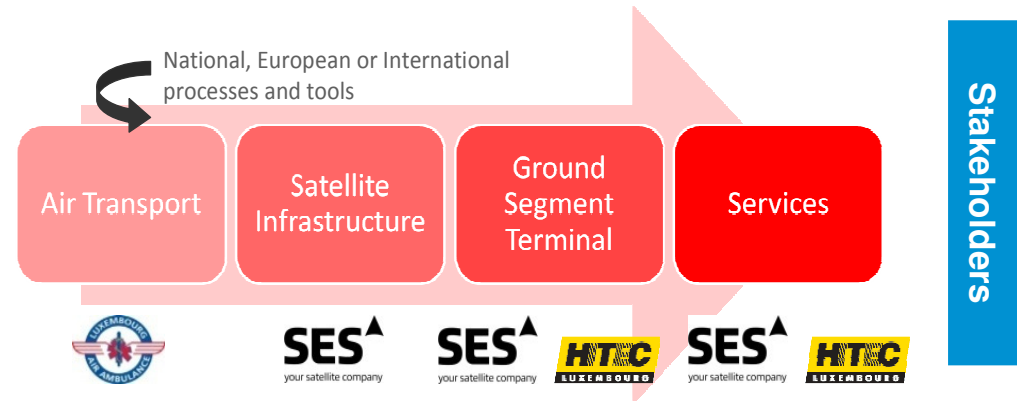
Ban Ki-Moon

Secretary-General of the United Nations

Powerful and fruitful cooperation between the Government and industry

# The Stakeholders

- ▲ SES TechCom, SES, HITEC, Lux Air Rescue
- ▲ Luxembourg Government, Ministère de la Coopération et de l'action Humanitaire, Direction de la Coopération au Développement
- ▲ Target customers: United Nations, and other actors in global humanitarian community (e.g. Red Cross, NGOs, European Civil Protection agencies)



**emergency.lu is an evidence of a successful cooperation between Luxembourg and its industry to provide worldwide humanitarian relief**



## IV. University of Luxembourg

- **Faculty of Science, Technology and Communication**
- **Faculty of Law, Economics and Finance**
- Faculty of Language and Literature, Humanities, Arts and Education
- **Interdisciplinary Centre for Security, Reliability and Trust (SnT)**
- Luxembourg Centre for Systems Biomedicine.



# SES Chair in Satellite Communications and Media Law

Established in 2009

Co-financed by the University and SES

Research in Space Communication Law

Annual Multidisciplinary Workshops in Space  
Communication

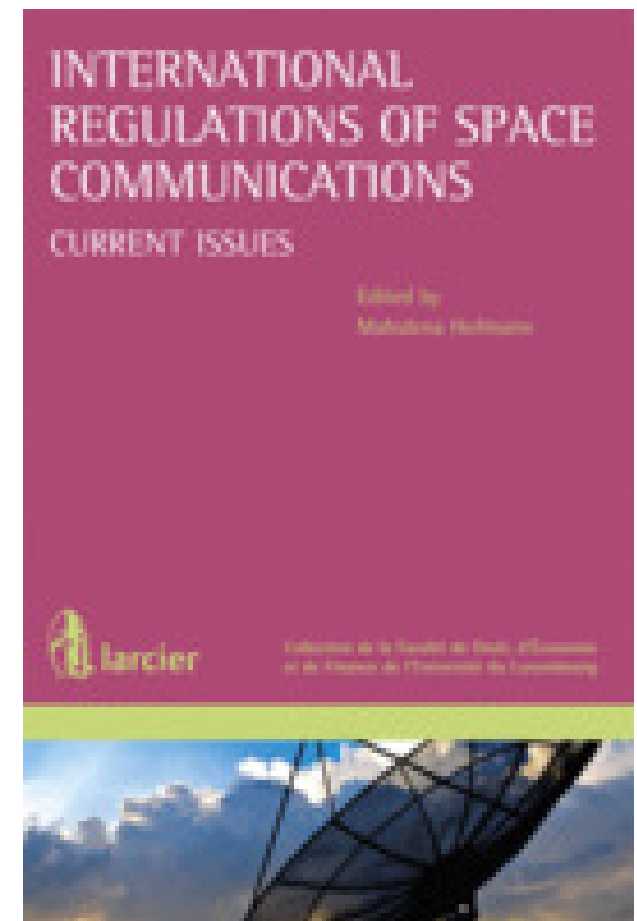
Cooperation with ITU

## **Master program (option) in Space Communications**

1st Year: Space Communication in a Regional (European)  
Perspective

2nd Year: Space Communication in an International Perspective

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## V. Conclusion

- The application of Luxembourg for membership with the United Nations Committee on the Peaceful Uses of Outer Space was received by the Secretariat on 8 November 2013 and was circulated to member States of the Committee in note verbale OOSA/2013/12, CU 2013/249/OOSA/CPLA.
- Given the scale of its space activities, Luxembourg believes that it will be able to make a useful contribution to the work of the Committee.
- Luxembourg would appreciate if its application for membership be accepted.