OUFTI - 1

The CubeSat developed at the University of Liège, BELGIUM

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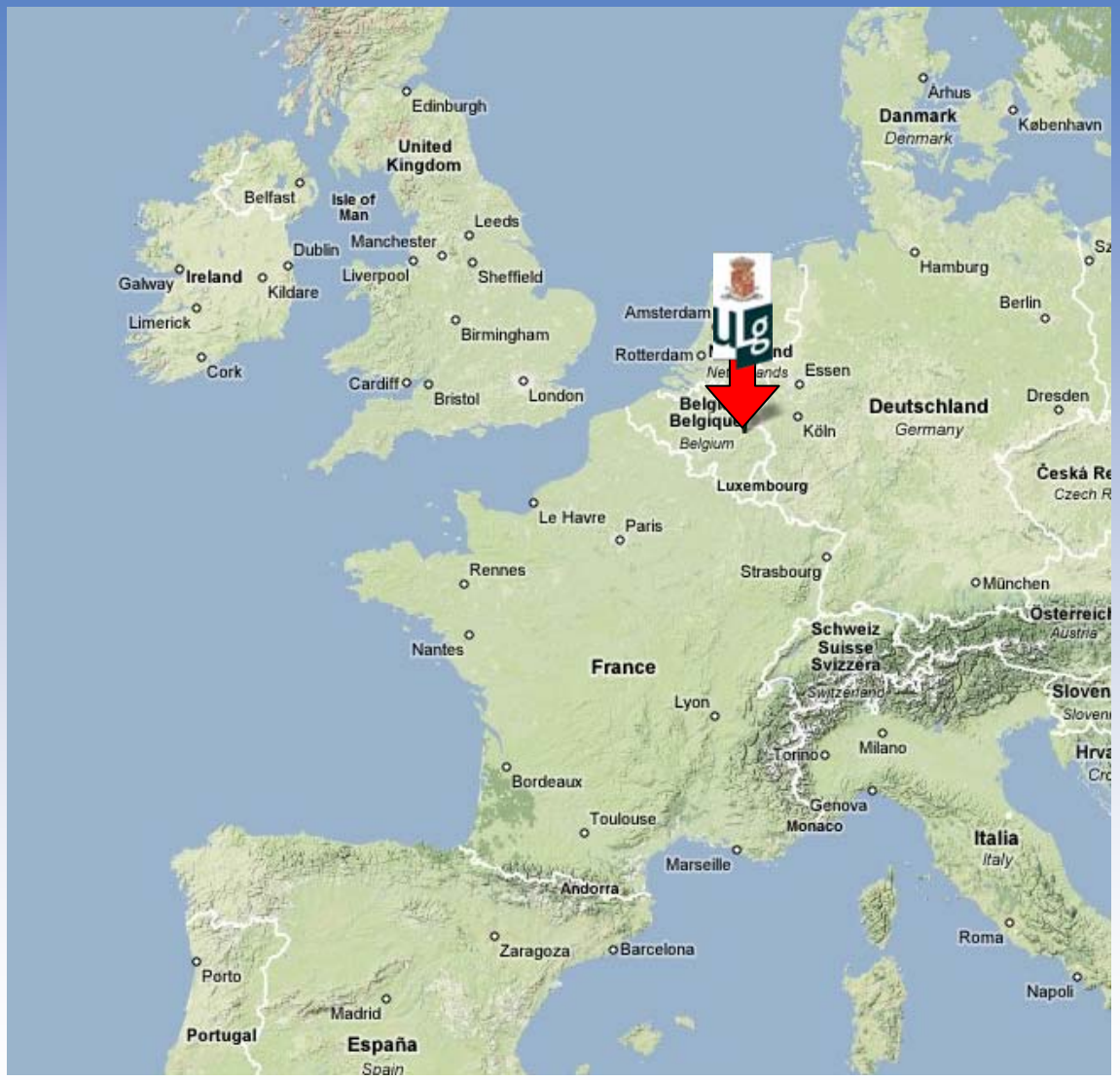
Outline

1. University of Liège
2. Objectives
3. About D-STAR…
   - What ?
   - Why ?
   - How ?
4. System overview
   - Ground station
   - Space segment
5. Schedule and launch
6. Conclusions

1. University of Liège (« ULg », Belgium)



2. Objectives

Primary Goal

→ Hands-on satellite experience for students

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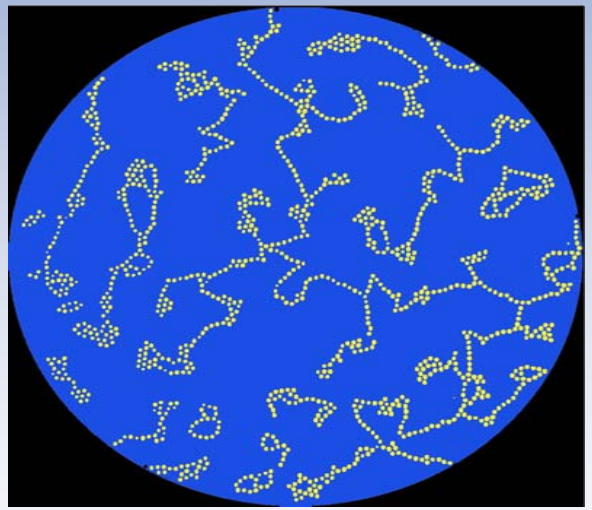
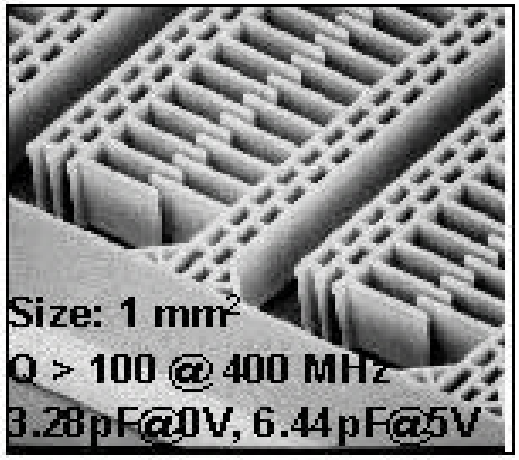
Long-term Goal

→ Series of CubeSats for scientific experiments



Granular materials
(Prof. Vandewalle)



MEMS
(ULg - CSL)

2. Objectives

Primary Goal

→ Hands-on satellite experience for students

Long-term Goal

→ Series of CubeSats for scientific experiments

Short-term Goal

→ OUFTI - 1

2. Objectives

OUFTI - 1

- « Waouv ! »
- Orbital Utility For Telecomunication Innovation
- **First** nanosatellite from the University of Liège
- **First** nanosatellite ever developed in Belgium
- **First** CubeSat fitted with D-STAR
- Corresponding D-STAR ground station and ground repeater

↳ What ?

☞ Digital Smart Technologies for Amateur Radio

- Amateur-radio digital radiocommunications protocol
- Simultaneous voice & data transmission
- Complete routing capacity, including roaming
- “Amateur radio over Internet”
- 3 frequencies and 2 data rates
  - 144 MHz (2 m, VHF), 4.8 kbit/sec
  - 440 MHz (70 cm, UHF), 4.8 kbit/sec
  - 1.2 GHz (23 cm, SHF), 4.8 kbit/sec or 128kbit/sec
- Open protocol

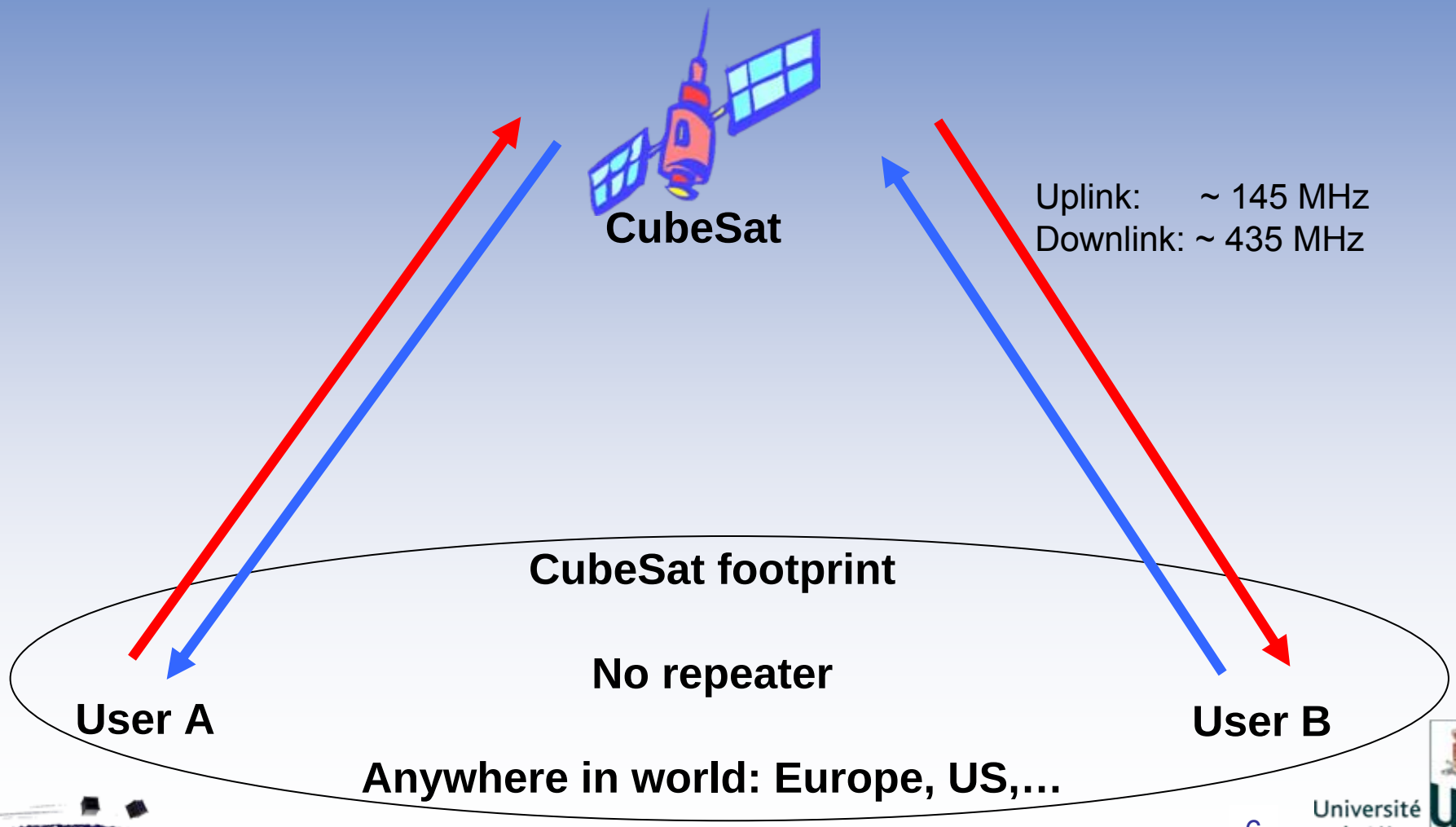
3. About D-STAR…

↳ Why ?

D-STAR vs. FM

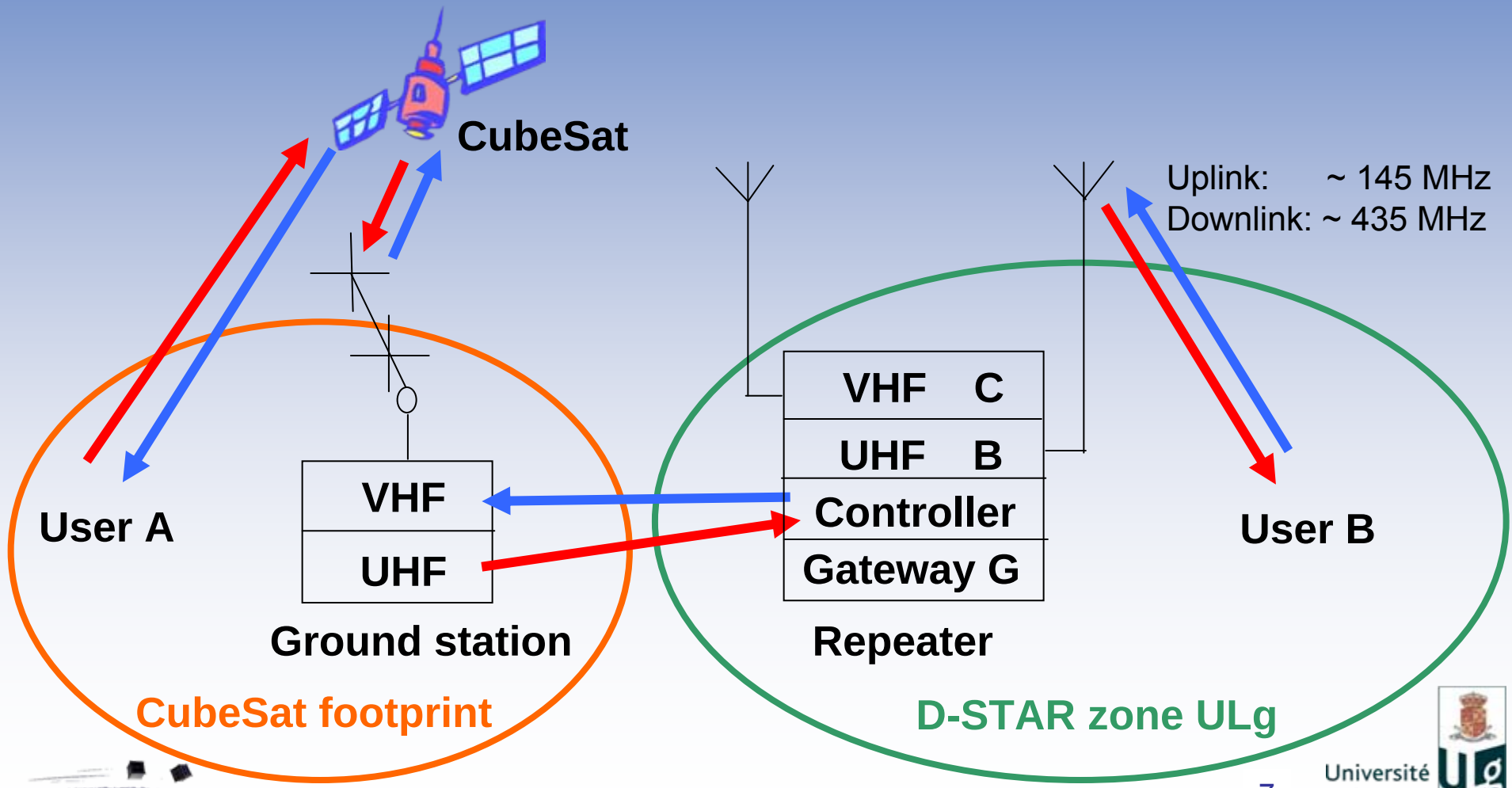
↳ How ?

Situation 1: Users in CubeSat's footprint



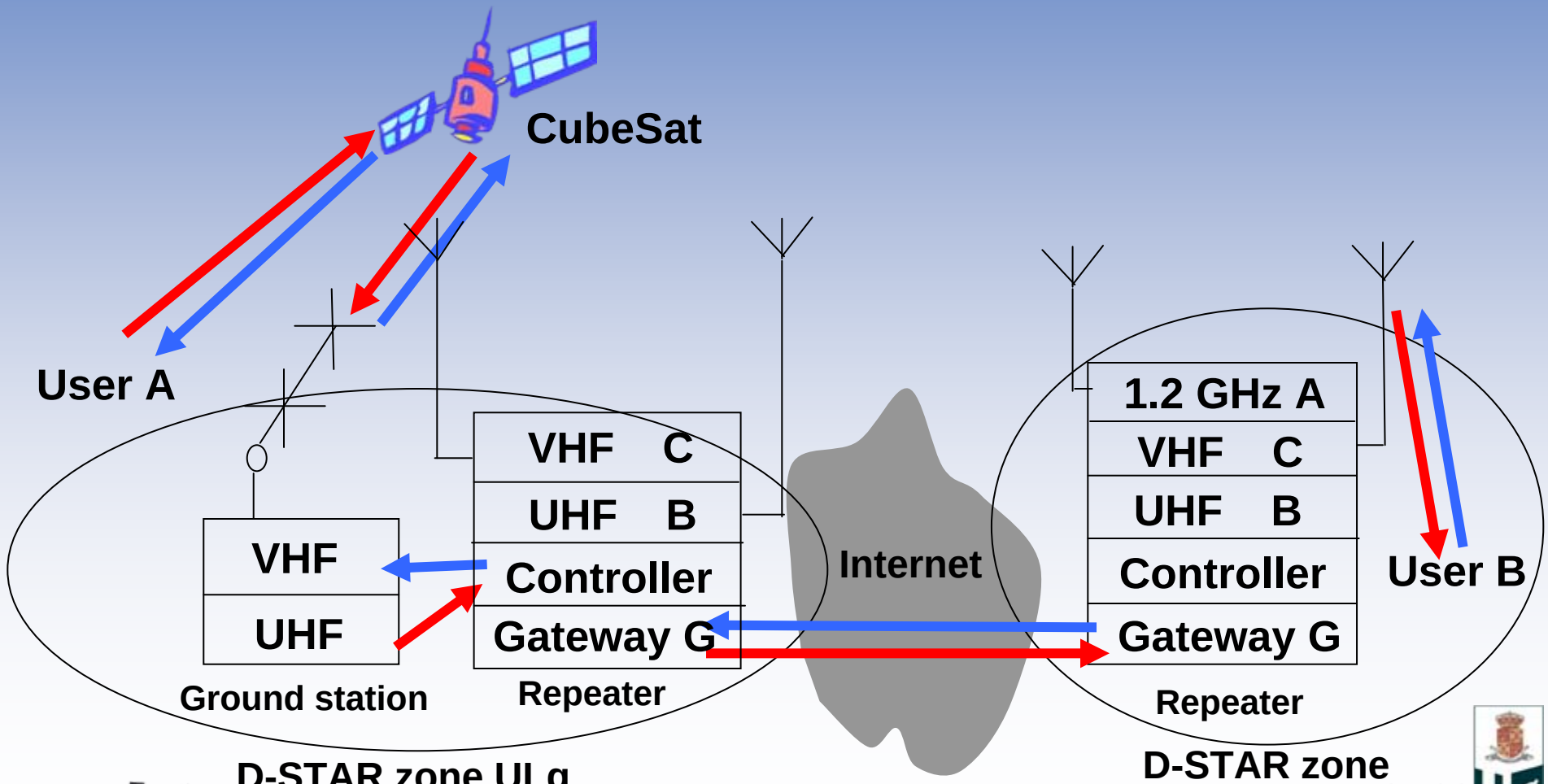
How ?

Situation 2: Using CubeSat and ULg repeater



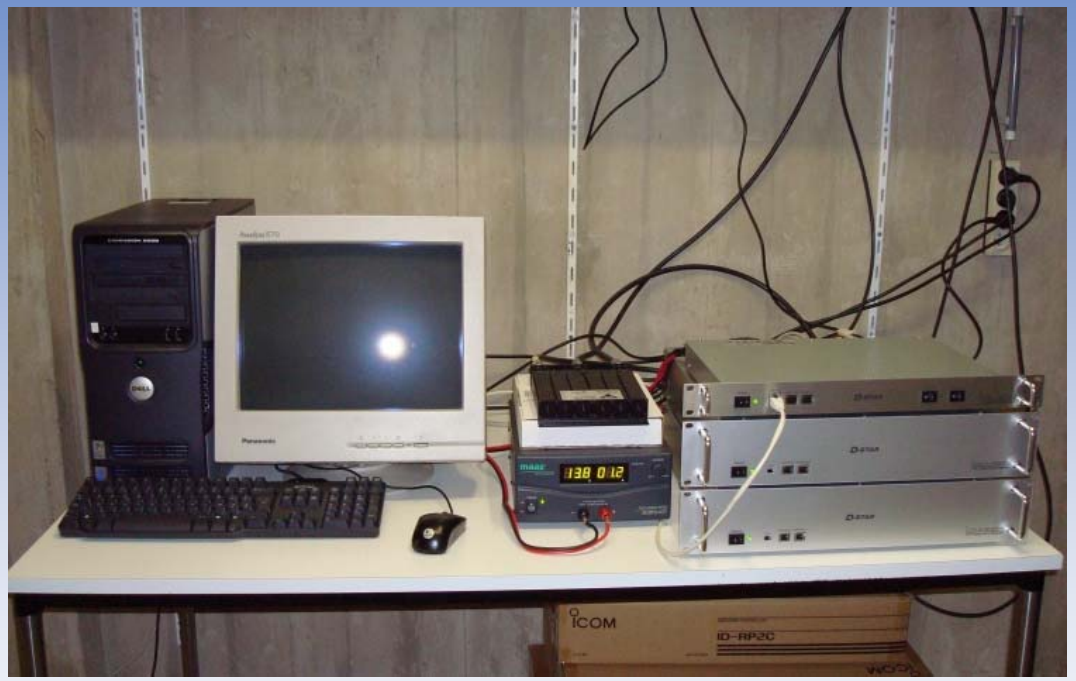
How ?

Situation 3: Using CubeSat, ULg repeater and Internet



4. System Overview

↳ Ground segment



ON0ULG D-STAR repeater

4. System Overview

↳ Space segment

Structures and mechanisms

Power system

Communication

C&DH

ADCS

Thermal system

5. Schedule and launch

Phase A → Phase B1 → Phase B2 → Phase C & D

11.07 — 03.08 — 06.08 — 12.08 — 06.09 — 07.09

Ground station and repeater installed at ULg

Mission defined

Critical elements defined

Leodium ready to be built

Vega Maiden Flight ?

Project defended at ESA/ESTEC in January 08

7. Conclusions

- **Challenging** schedule but…
  - motivated team
  - simplicity
  - strong academic and industrial support
- Unique, exciting, enriching **experience**
- **Innovative** communication system
- **Belgium's first** D-STAR repeater
- **World's first** D-STAR satellite

7. Conclusions

☞ www.oufti.ulg.ac.be

Thank you for your attention !

→ Questions ?