



# NIMPH

[CubeSat 3U | Phase C]

**Nanosatellite to Investigate  
Microwave Photonics Hardware**



NTN - 01 octobre 2025





# NIMPH

[CubeSat 3U | Phase C]

## Nanosatellite to Investigate Microwave Photonics Hardware

### EDMON [Erbium Doped fiber optic amplifier **MON**itoring]



Qualification de l'usure des fibres optiques en milieu spatial

### THINGSAT



Collaboration avec le CSUG, création d'un nœud LoRa 868MHz

### M2M [Machine 2 Machine]



Application spatiale du M2M un use case médical de transmission des données d'un patient

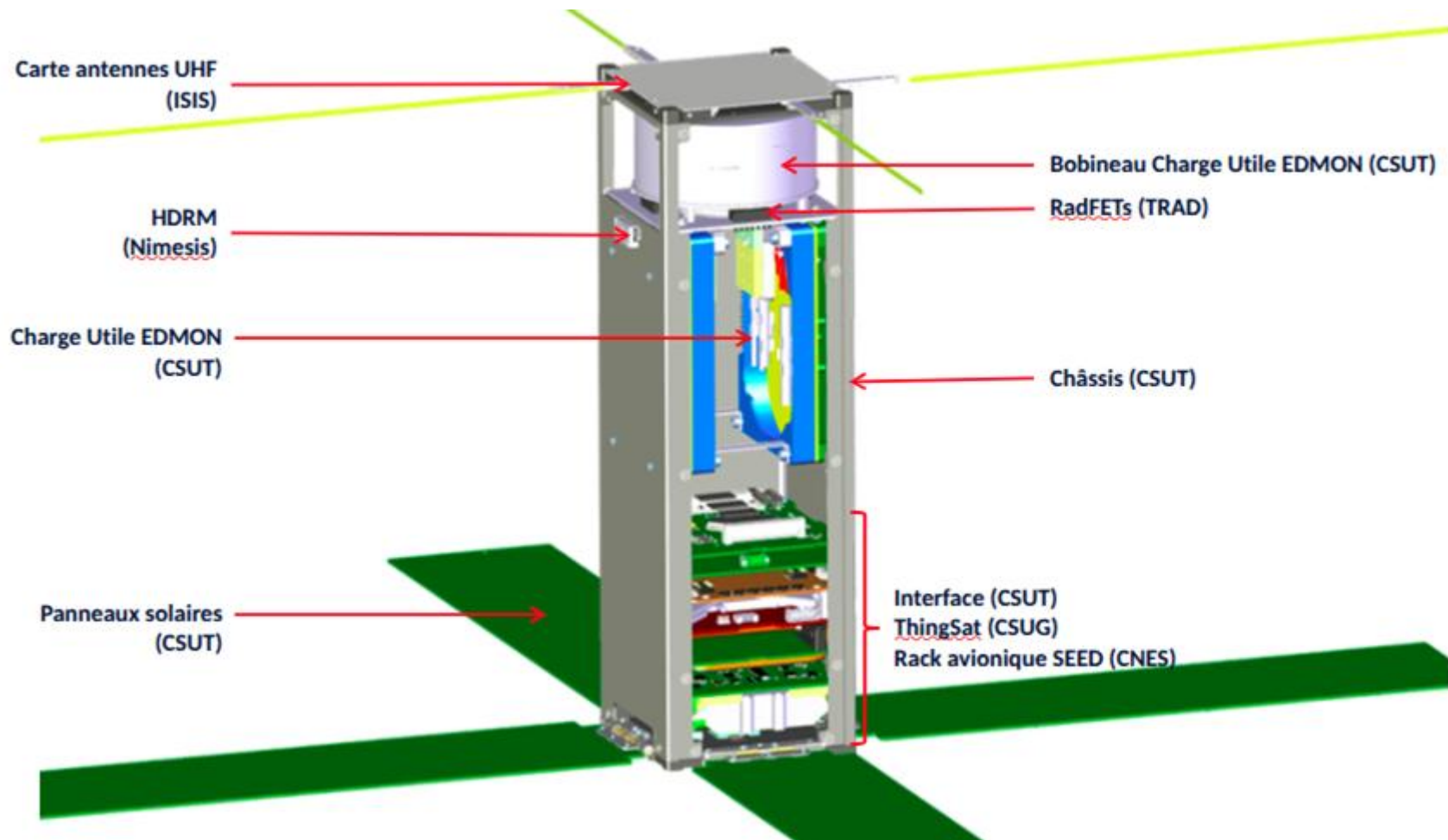
### RAM [Radio **AM**ateur]

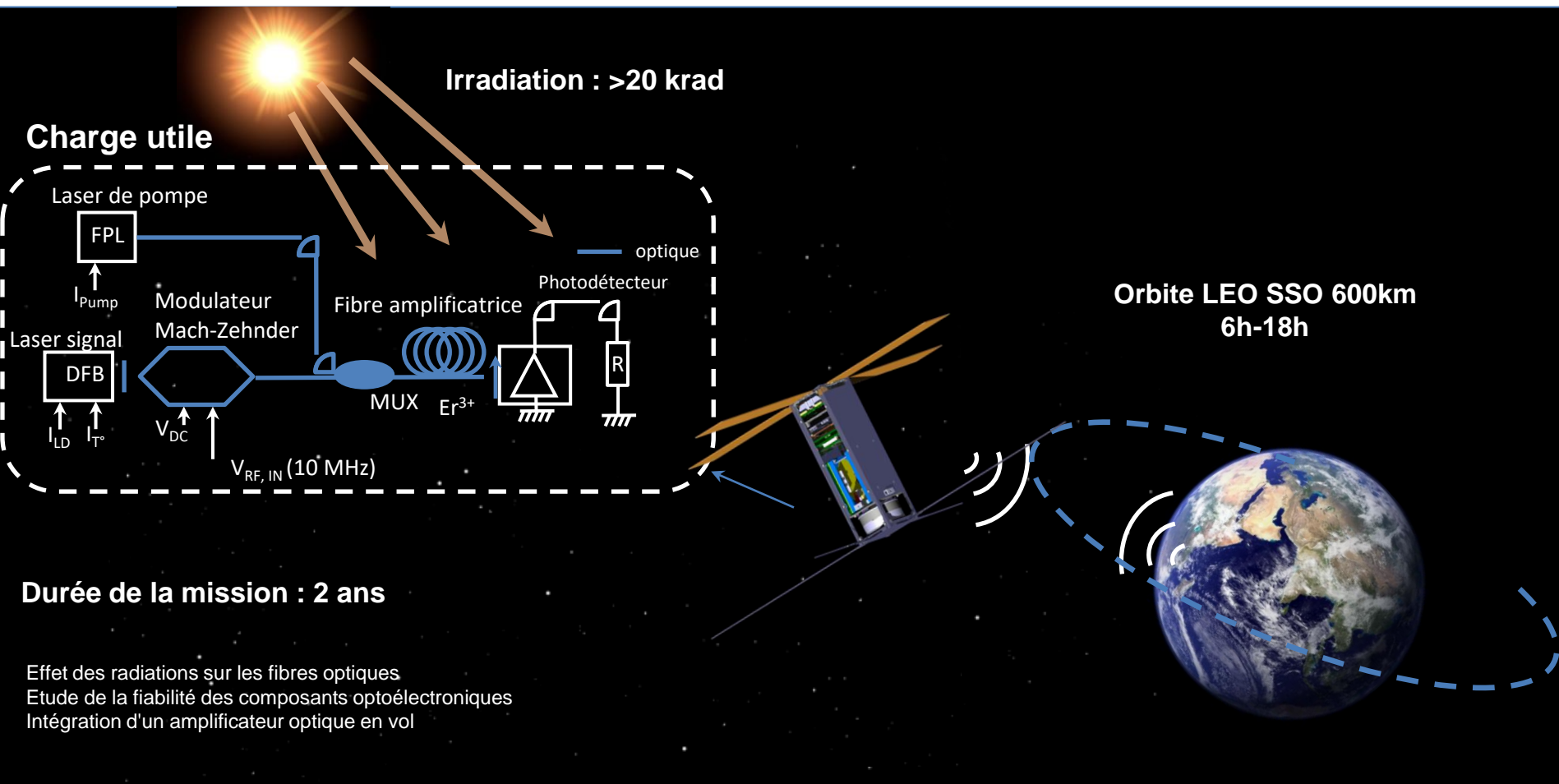


Ouverture du nanosatellite à un système d'échange de données entre radio amateurs.

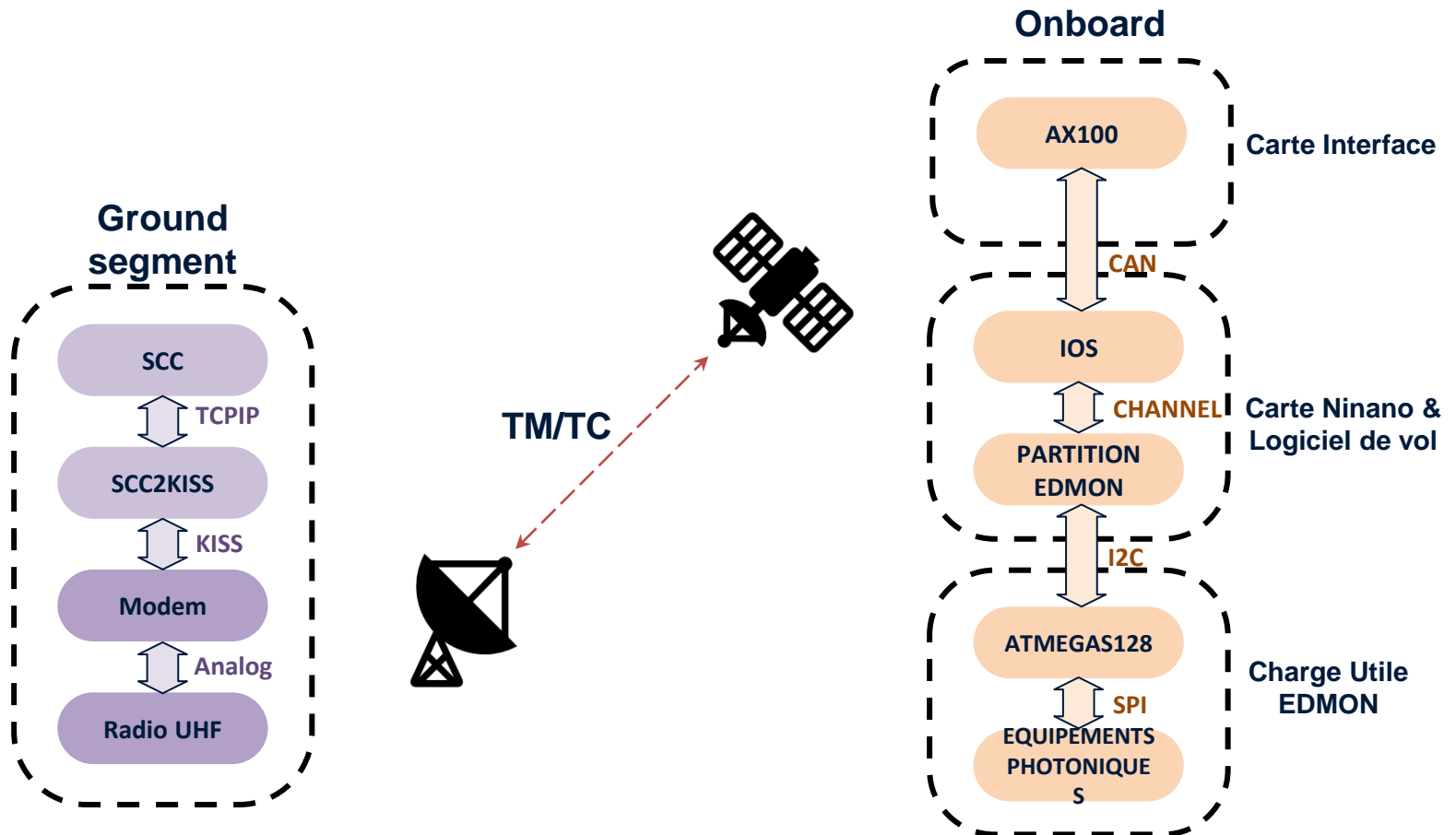


Expected launch Q3 2026

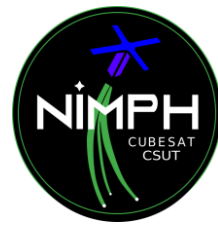




# Radio telecommunications architecture



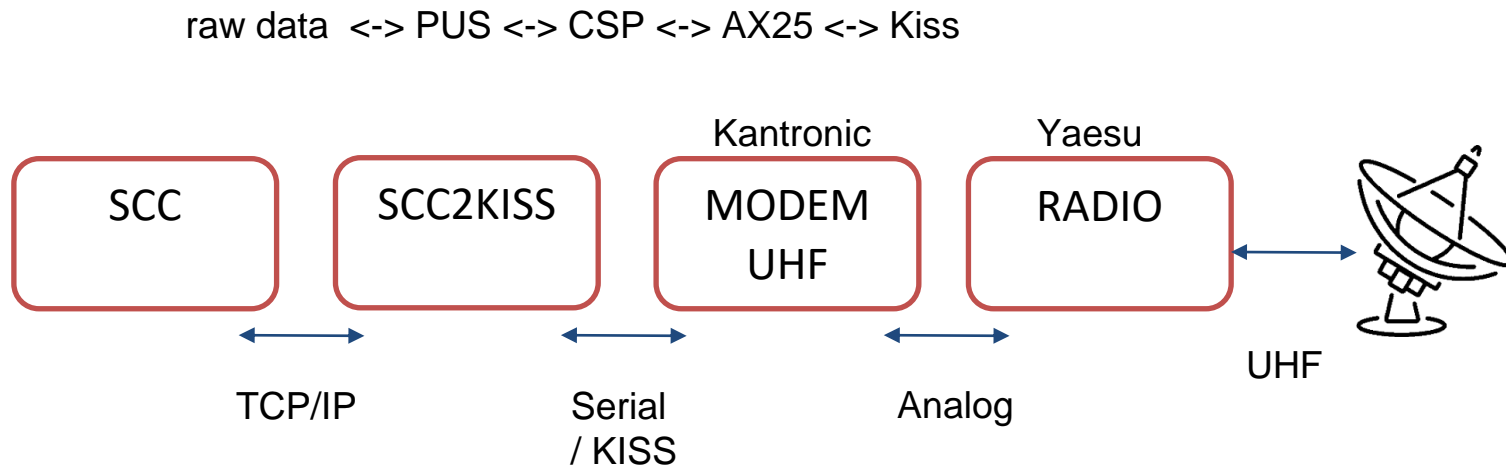
# Ground segment / TMTC remote control



TC - ESA ECSS-E-ST-70-41-C

Data
PUS
CSP
AX25
KISS

Data
LwM2M
CoAP
PUS
CSP
AX25
KISS





# Onboard / TMTC and Telemetry

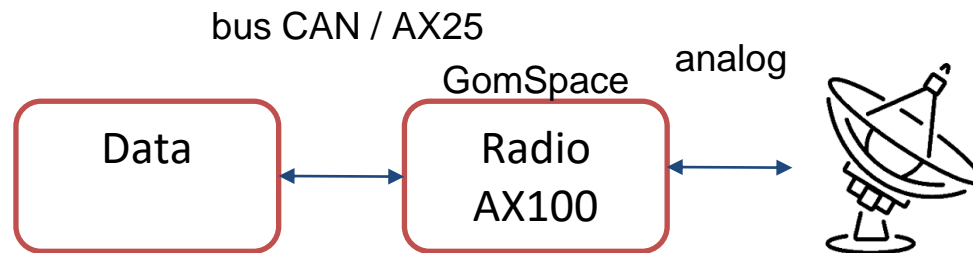


TM - ESA ECSS-E-ST-70-41-C

Data
PUS
CSP
AX25

Data
LwM2M
CoAP
PUS
CSP
AX25

Message brut <-> PUS <-> CFP <-> CSP <-> AX25



# Onboard / Telemetry



TM/TC - ESA ECSS-E-ST-70-41-C - Multipoint system (M2M + RAM)

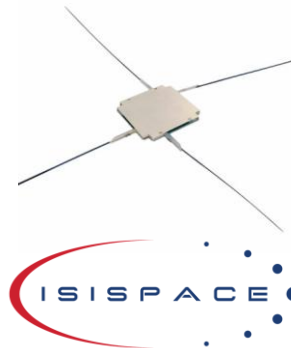




# Radio features



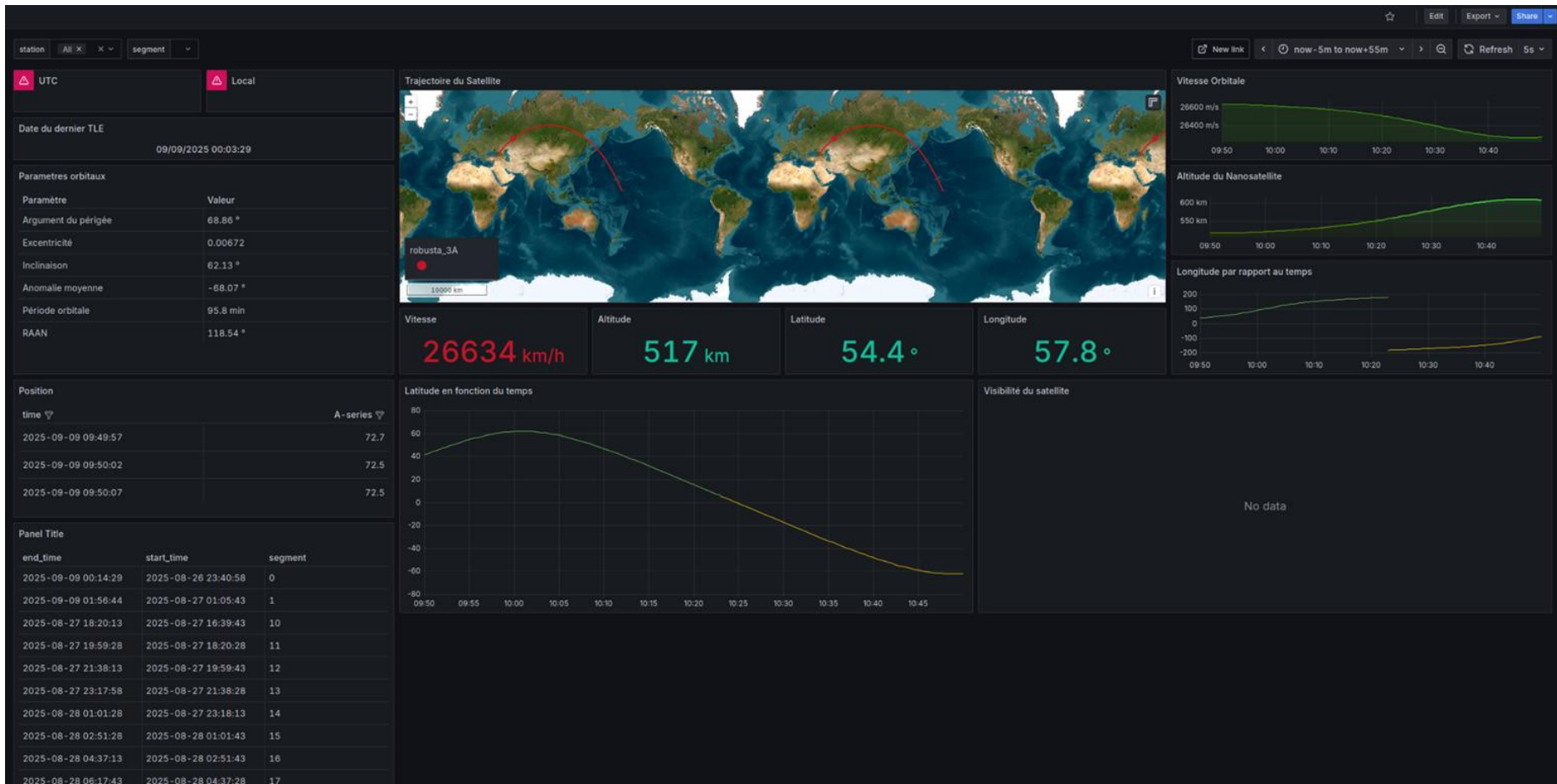
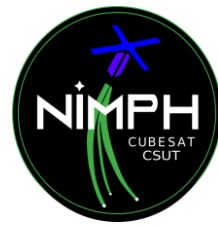
- Radio : GomSpace AX100
- Uplink, downlink 437.175 MHz (TBC) GMSK 9600 bauds AX-25
- In-flight frequency change
- Antenna UHF ISIS





- Encapsulated in the PUS protocol
- Protocol UDP / Raw data
- Data packet with timeout
- Ack / no Ack
- Limited data volume for each destination
- Authorization for each sender
- Error correction at level 1 (modem) and level 5 (session)
  - Level 1 : CRC / Reed–Solomon error correction
  - Level 4 : PUS CRC
  - Level 5 : Correction on demand (check and get lost packets)

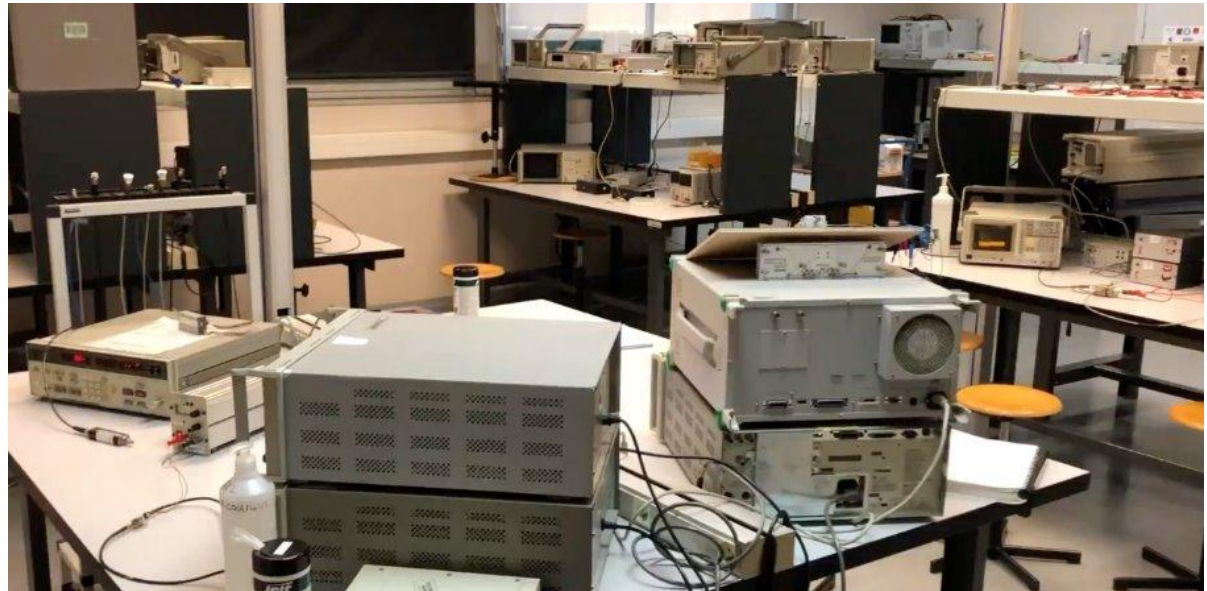
# Tracking and position simulation



# Ground segment



Bandes VHF/UHF - TM/TC



- Remote control possible from LAAS with SCC and SCC2KISS

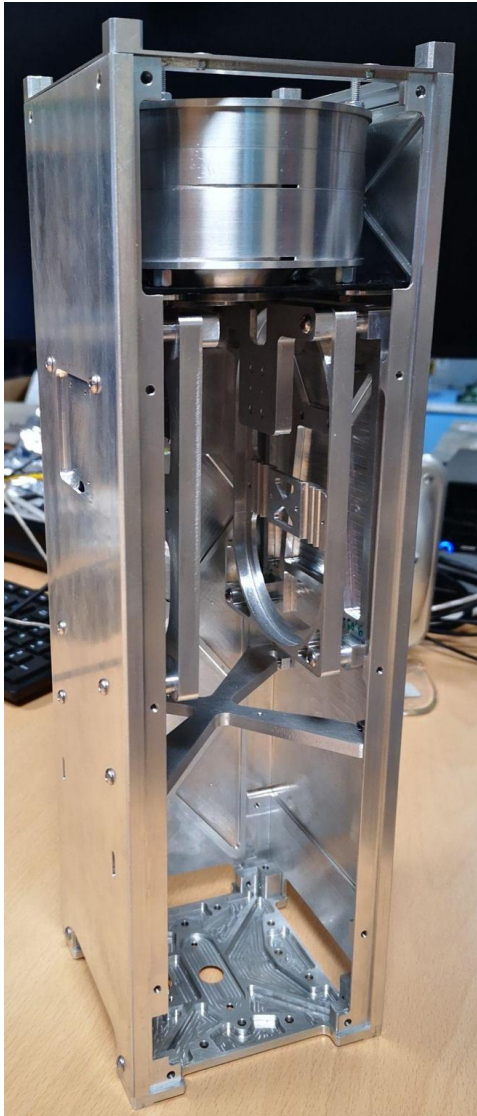


Space room



The Engineering Model v1

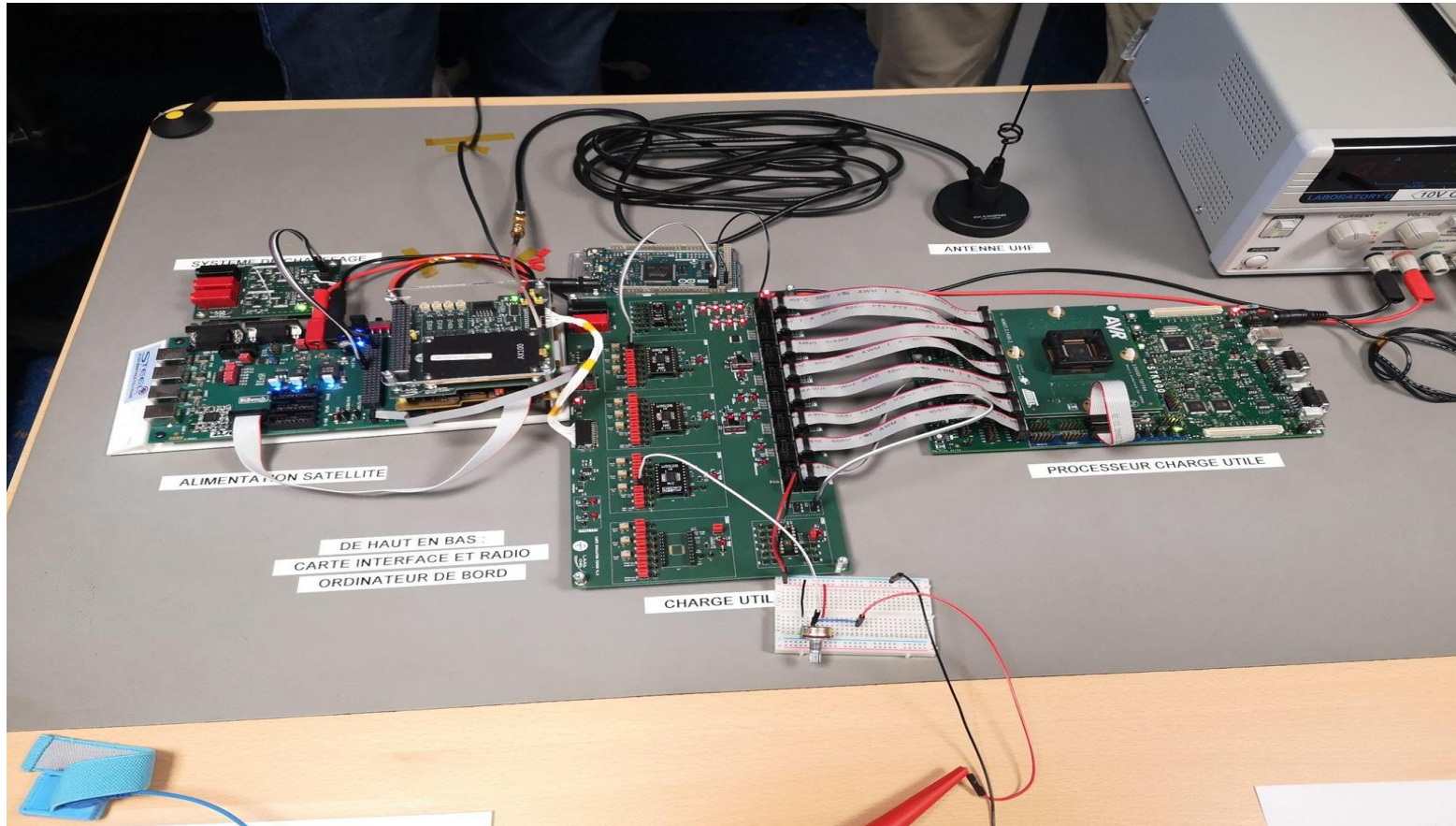




The Engineering Model v2

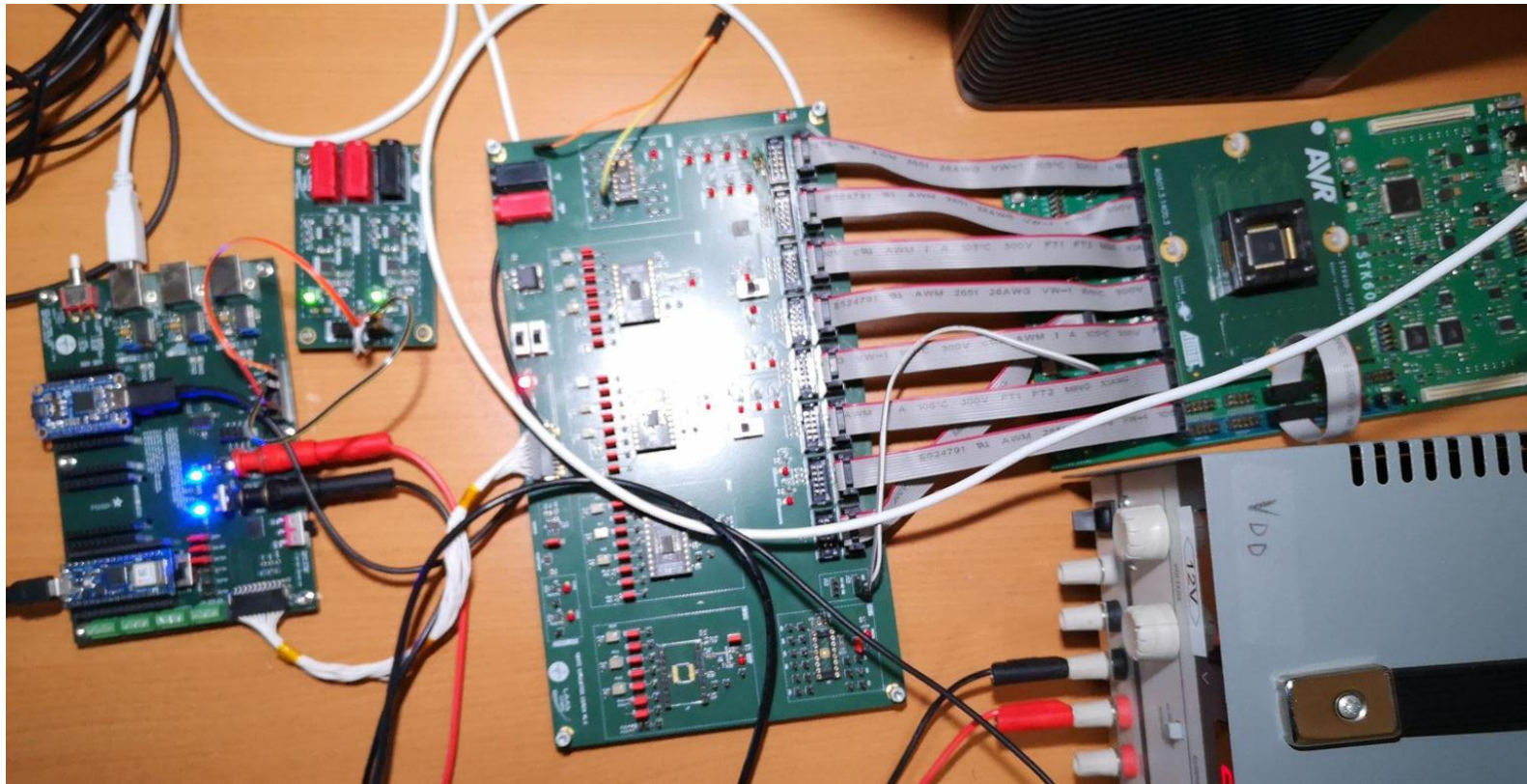


Interface card



Flat sat





Payload EDMON simulation platform

# NIMPH

[CubeSat 3U | Phase C]

**Thank you for your attention**  
**Any questions ?**



NTN - 01 octobre 2025