A view on satellite observation of the oceans

Programmatic context at CNES

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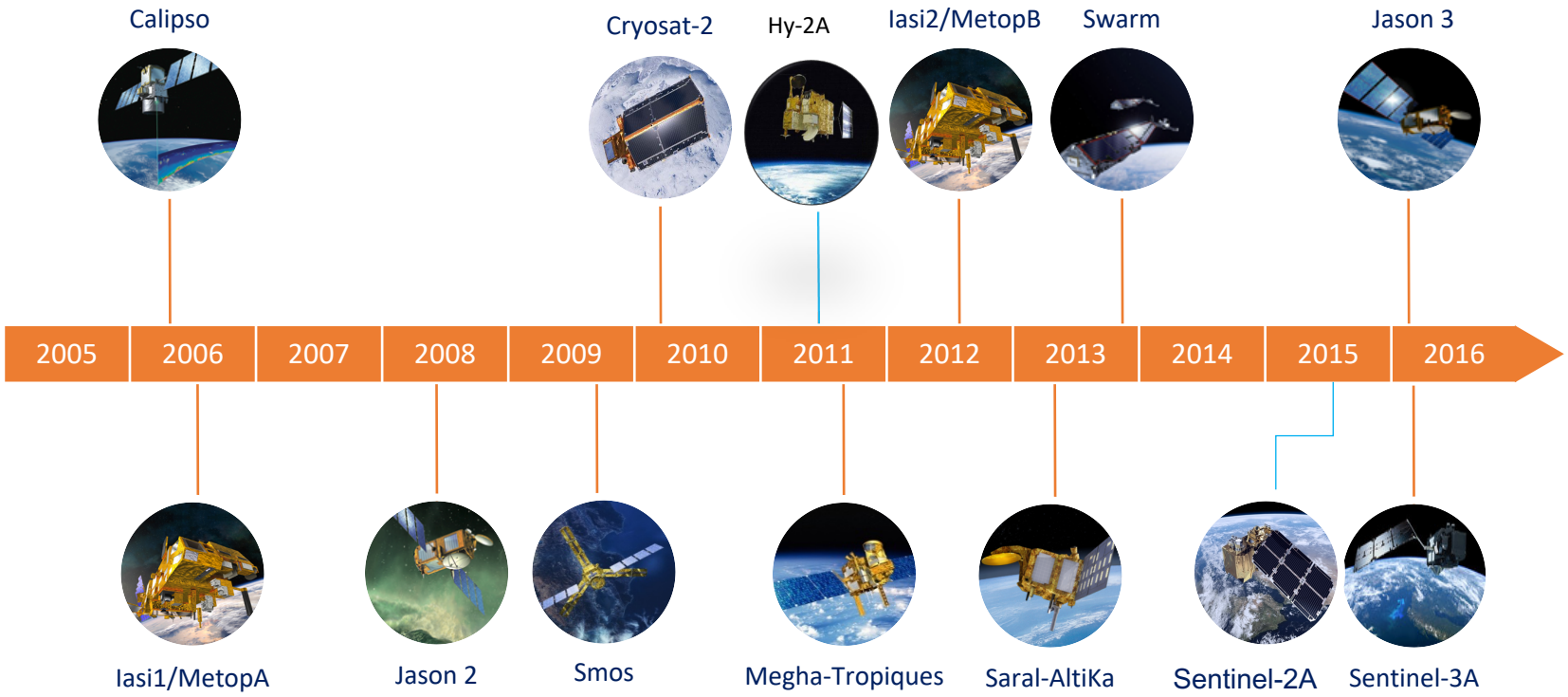
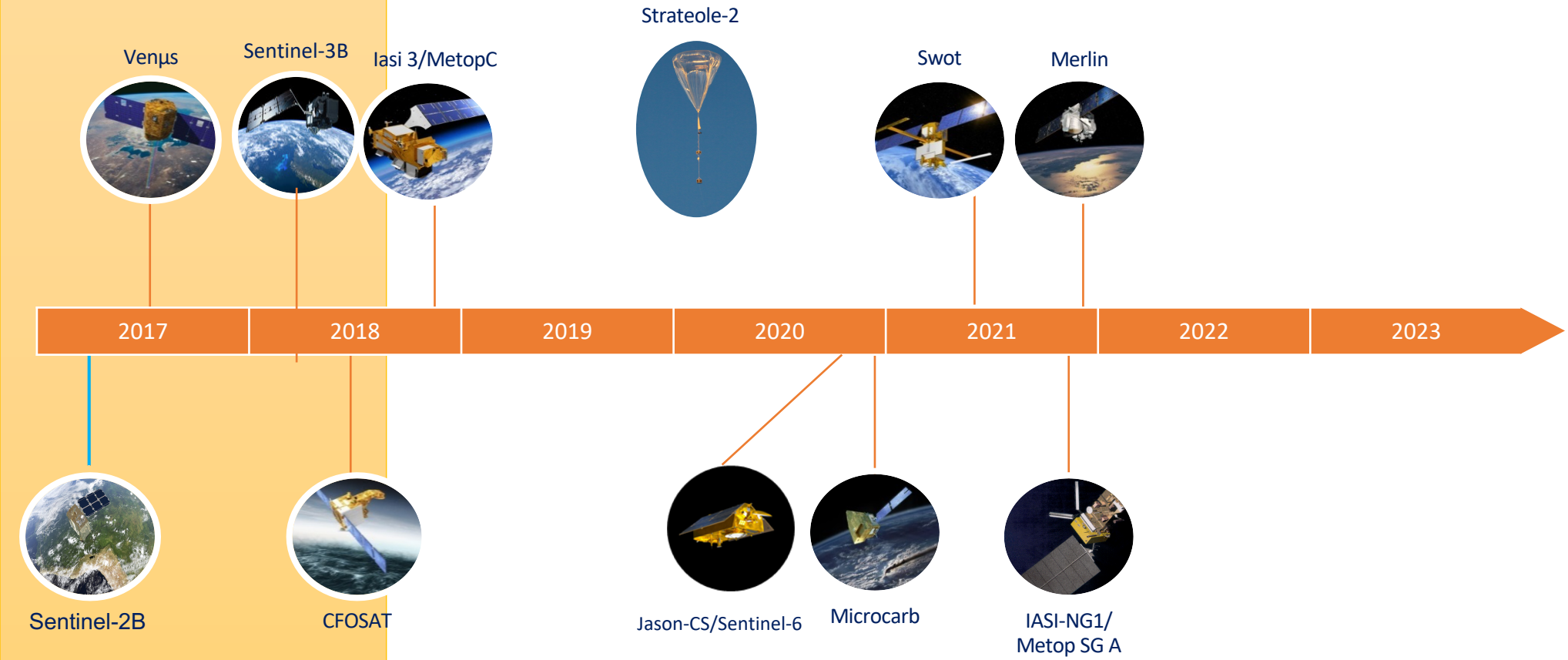
Observation: mission in operation



Observation: missions in development



Data centers, science, applications

4 data centers:

- Theia (land)
- **Odatis (ocean)**
- Form@ter (solid Earth)
- Aeris (atmosphère)

Science project funding

- ~10 M€ / year
- CNES projects science teams.
- Satellite Earth observation science

Applications

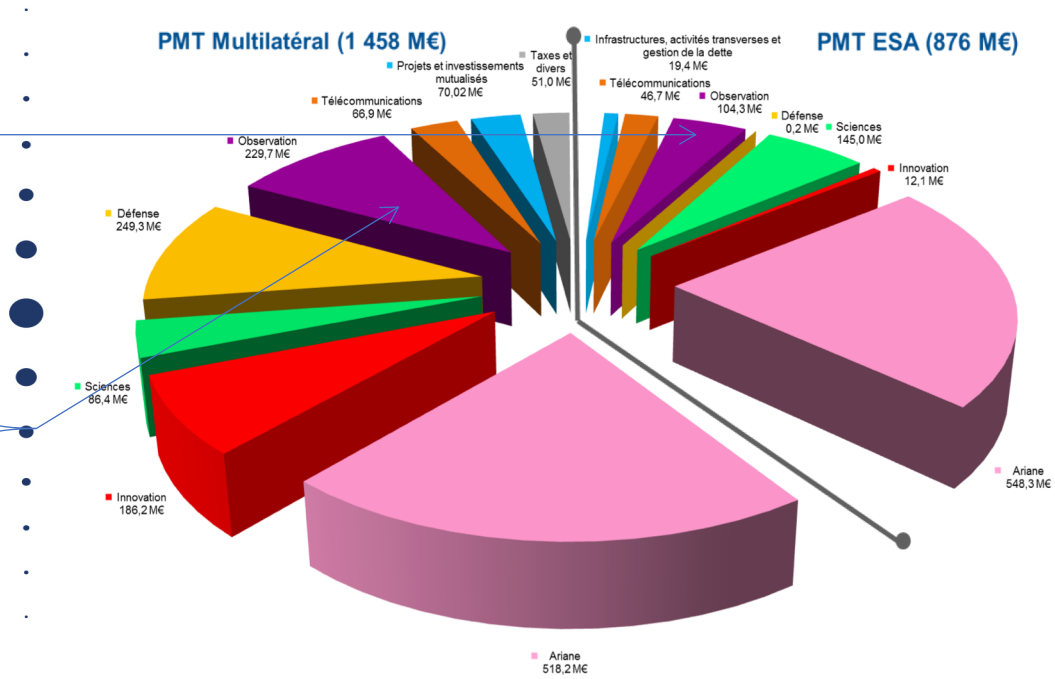
- From missions to applications (eg SMOS, SWOT)
- From societal needs (DIA/SA)

Program funding

CNES EO Budget

Different lines:

- Participation to ESA EO programs: Earthwatch, Earth Observation Enveloppe Program, Climate Change Initiative…
- CNES National programs (CFOSAT, IASI-NG)
- PIA funding (SWOT, Merlin, Microcarb)
- EUMETSAT funding (IASI-2, 3…)



CNES programs

Missions in operations

- Grace (2000-) GOCE (2009-2013)
- Calipso (2006-) with NASA
- IASI on Metop-A (2006) and Metop-B (2012)
- Jason-2 (2008) with NASA, NOAA, Eumetsat
- **SMOS (2009 -) with ESA/CDTI**
- Megha-Tropiques (2011 -) with ISRO
- Pléiades 1-A and 1-B (2011 - , 2012 -)
- Altika on board SARAL (2013 -) with ISRO
- Swarm (2013-) (magnetic field) with ESA
- Jason 3 (2016-) with Eumetsat, NOAA, NASA
- Venµs (2017-) with ISA

Mission in development or just launched

- CFOSAT (October 2018) with CNSA
- IASI NG with Eumetsat on Metop SG
- Merlin (CD, 2021) with DLR
- SWOT (CD, 2021) with NASA
- Stratéole 2 (B/C/D, 2019)
- Microcarb (phase C/D, 2020) with UKSA

Phases O/A

- TRISHNA
- MESCAL
- ISA, Ulid, SMOS-HR, alti-Cryo, etc
- OCAPI, VASCO, GRASP, HYPEX…

About SMOS

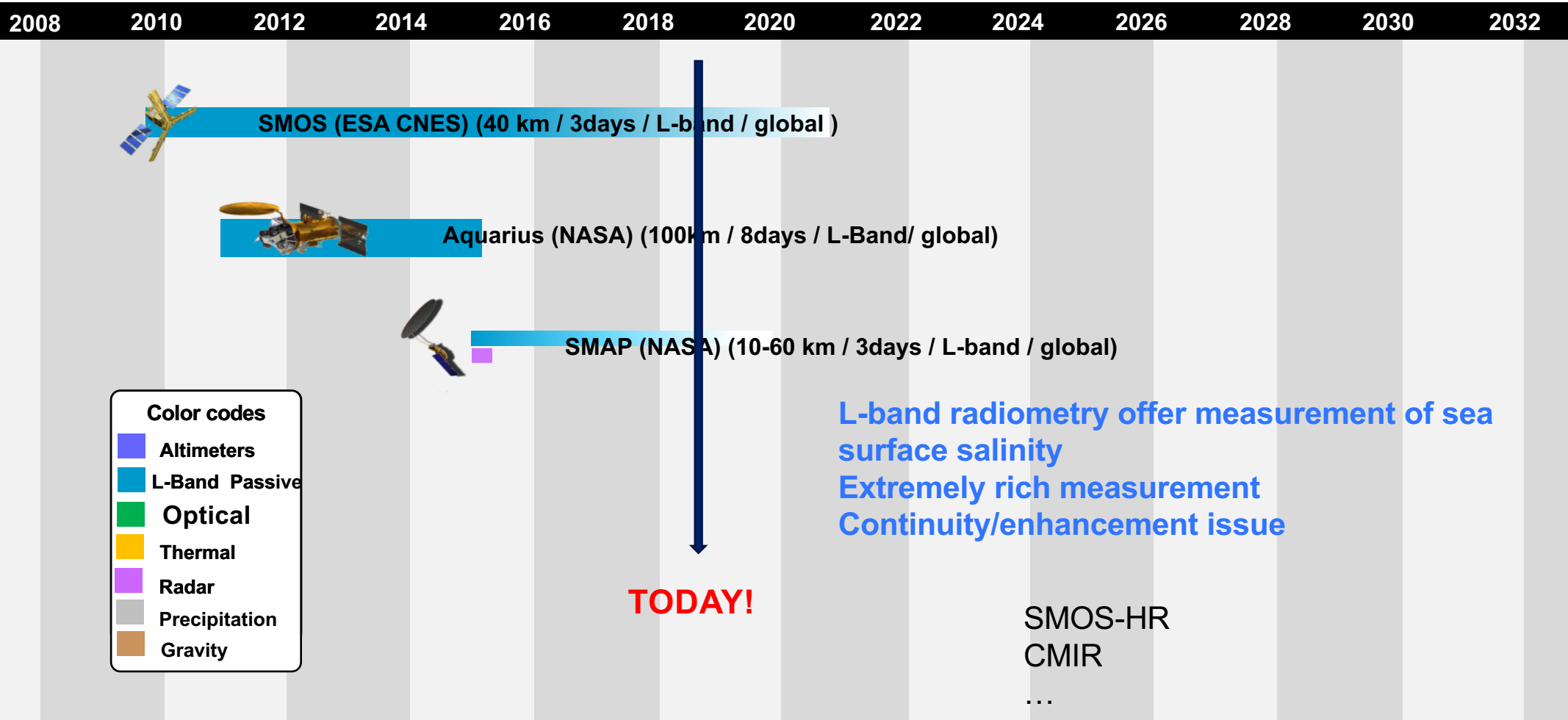
9 years old, still doing fine

Extension mission review OK both on CNES & ESA

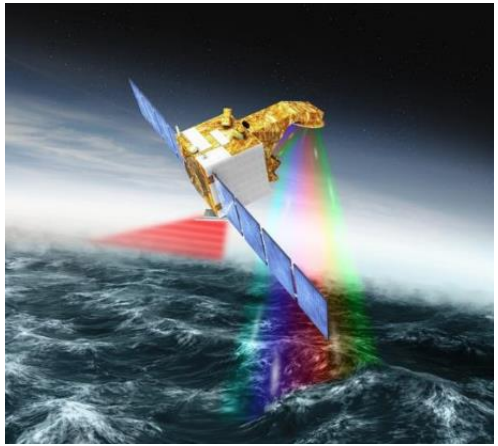
New science results every day (almost!)

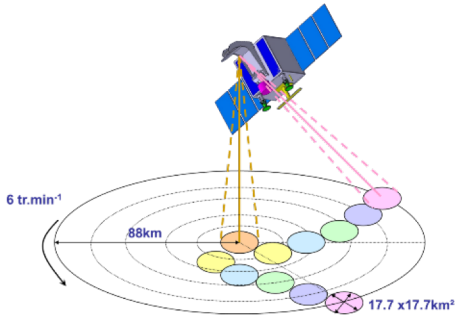
→ See presentations!!

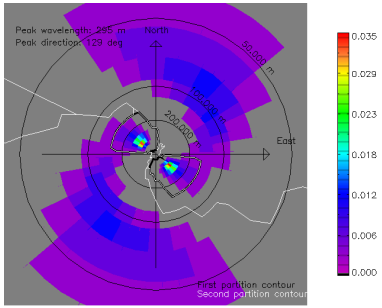
L-Band radiometry missions



Coming (very) soon: CFOSAT







CFOSAT: China France Oceanography SATellite

- **Two payloads:**
  - SWIM: wave scatterometer
  - SCAT: wind scatterometer
- **Orbit**
  - Altitude = 519 km
  - SSO (13 days repeat cycle)
- **Mission : 3 years duration**

Launched Oct 29th 2018

Call for proposals to set up an international science team on going (oceano@cnes.fr)

2018 – 2019 « Work plan »

Phases 0, A studies:

- MESCAL (cloud/aerosol lidar) with NASA
- C3IEL with ISA
- Support to SKIM ESA/EE9 proposal
- WISA wide swath altimetry concept for operational mission
- Nanomagsat (magnetic field)
- **ULID: demonstrator on nanosat**
- **SMOS-HR**
- …

Science prospective seminar:

- Will be held in Oct 2019
- Preparatory work: large scale science community consultation, dedicated working groups…
- Will provide Science (EO and space science) orientation for future CNES programs and activities

Space Climate Observatory

Summary

On CNES side

Present:

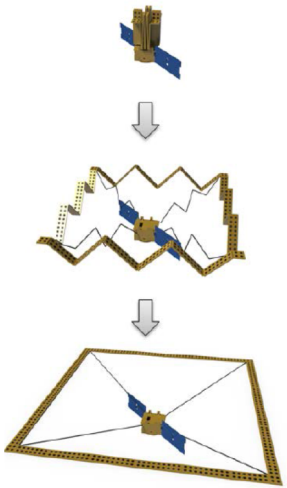
- SMOS in good health and no worries as to the mission extension
- CMIR (Sentinel Expansion) could provide an gap filling mission

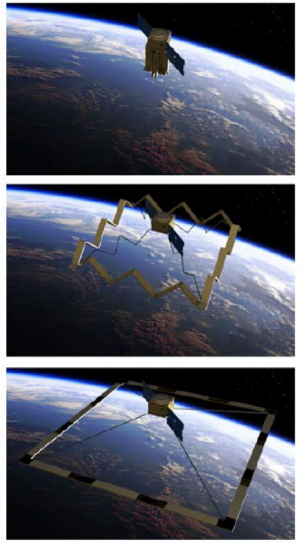
Preparing the future

- ULID starts its phase A
- SMOS-HR in phase 0

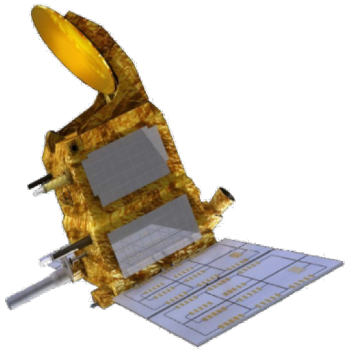
Programmatic context

- Not much funds available in the short term
- Approached by CNSA which is interested in OS and SM missions
- Concept of a L band radiometry long term programme
- Necessity to think and work in the framework of the next « séminaire de Prospective du CNES »
- Lobbying necessary!!





Thank you !



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