

# Initiatives on Space and Security developed at national level in France

**Sinaia**

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# CNES missions

## An ambitious French space policy



At Europe's  
service to:

- ◆ provide end-to-end space expertise
- ◆ be a driving force for contributing to and implementing Europe's space policy

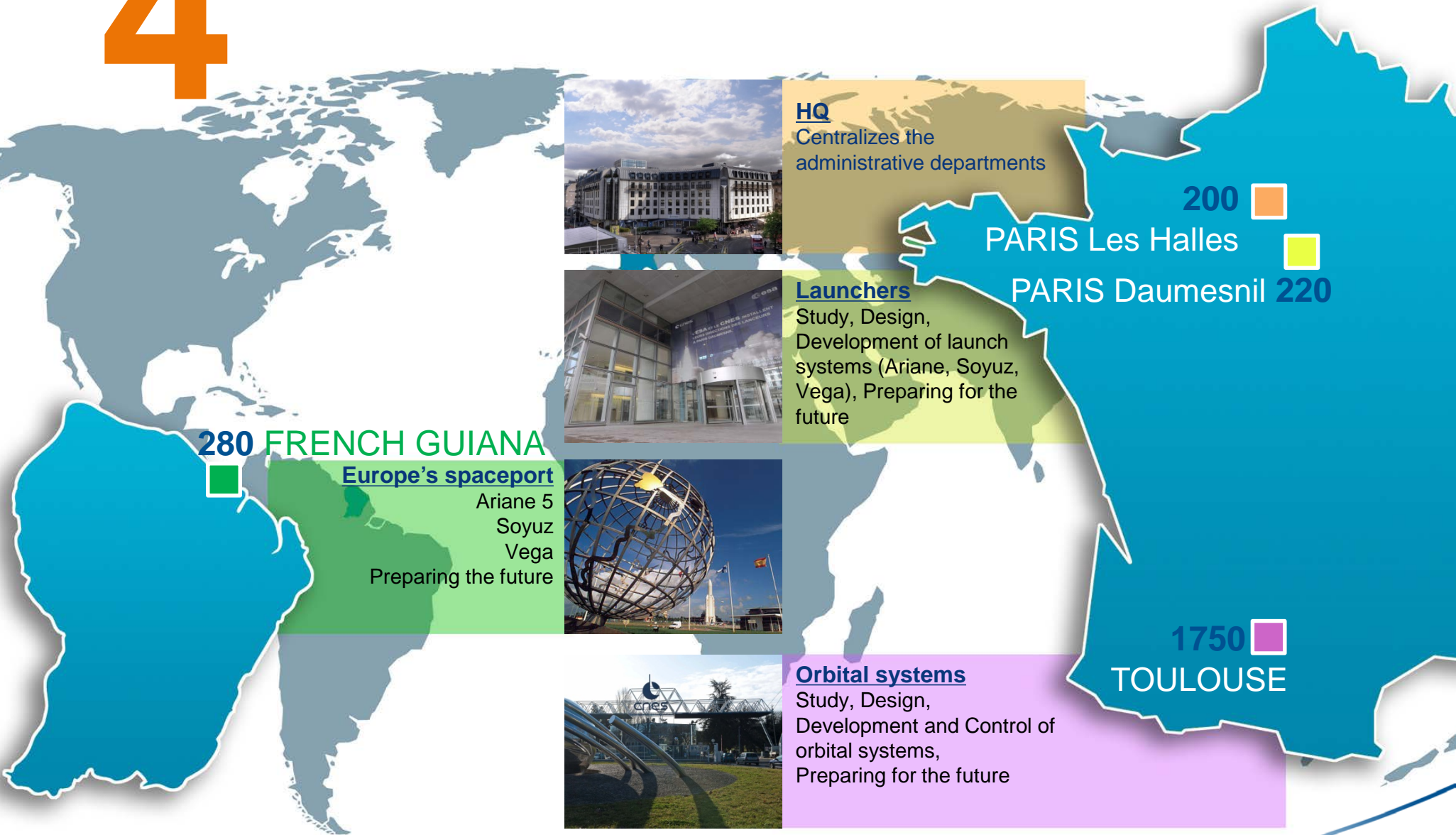
## 5 strategic areas

- ◆ Ariane
- ◆ Telecommunications
- ◆ Observation
- ◆ Sciences
- ◆ Defense



# 4

## Centres of excellence



**The security of citizens also depends on space**



- Intelligence gathering
- Communication
- Space surveillance

# Defence and Security

CNES is under the joint authority of the Ministry for Higher Education and Research and the Ministry of Defense

- ◆ Under powers delegated by the French Defence Procurement Agency (DGA), CNES manages projects for the space segment of Defense programs.
- ◆ It is also responsible for operational management of Defence satellites.
- ◆ The CNES-Defence team, including personnel from CNES, the Joint Staff and the DGA, is in charge of preparing the future, monitoring projects, implementing dual systems (military/civil) and conducting R&T in the areas of Defence and Security.



## Knowledge and anticipation

The French White Paper on Defence and national Security (LBDSN, 2013) and the Bill on Military Planning 2014-2019 emphasise the new strategic function "Knowledge and Anticipation", which is largely based on space systems.

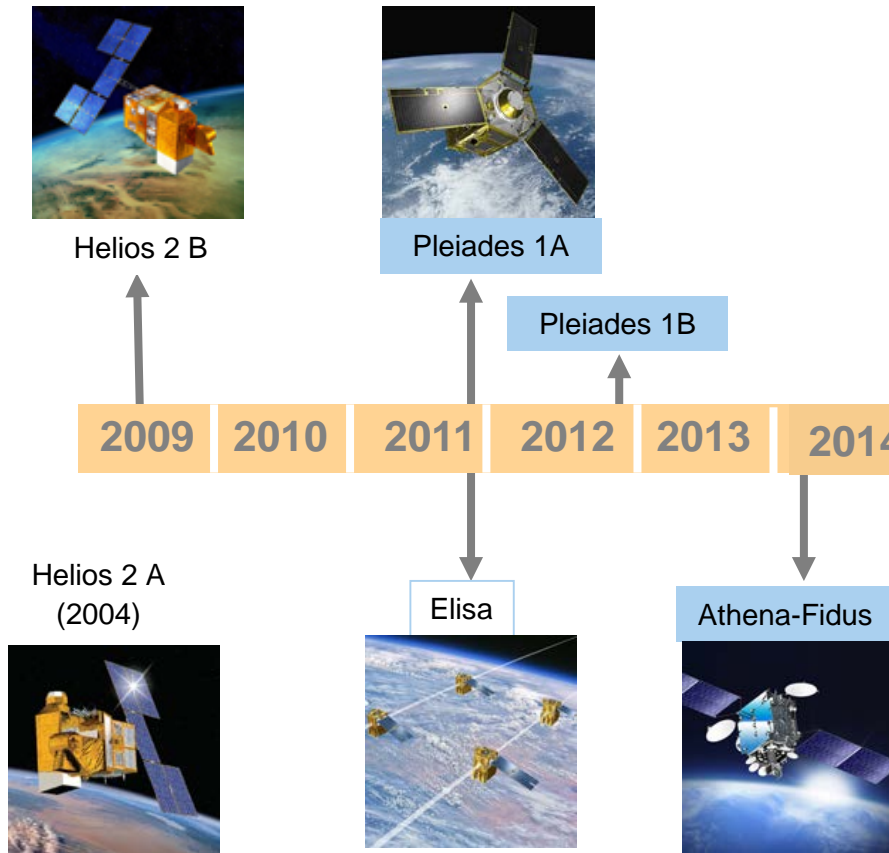
## The strategic importance of space

"Outer space has become vital to the functioning of essential services. In the military field, free access and use of space are necessary conditions to our strategic autonomy." (LBDSN, 2013)



# Defence and Security

## Current operational programs



## Programs under development



# Defence and Security

## Imagery intelligence

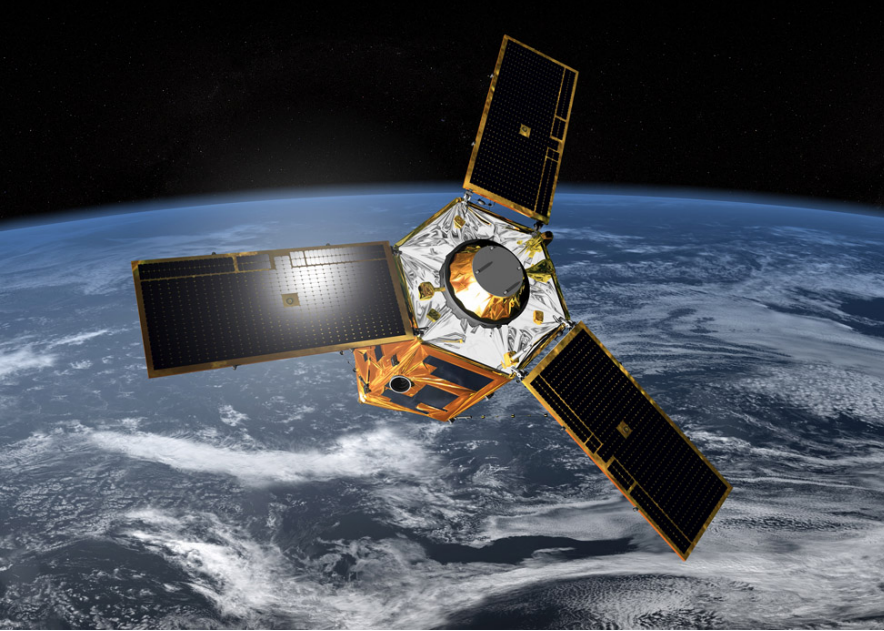
### Helios 2

- ◆ A major tool of the “Knowledge and anticipation” strategic function, offering French civilian and military authorities the requisite independence to enable them to assess situations, take decisions and implement them.
- ◆ Very good resolution, infrared capability and good manoeuvrability
- ◆ Programme conducted in collaboration with Belgium, Spain, Italy and Greece
- ◆ Image exchange agreements with Italy and Germany
- ◆ Programme financed by Defence budget

Helios 2A was launched in December 2004

Helios 2B was launched in December 2009





# Defence and Security

## Imagery intelligence

### Pleiades

*Dual use optical Earth observation system*

- ◆ High resolution (0.7m) and very high manoeuvrability that can meet the needs of different civil and military users
- ◆ Programme developed with Austria, Belgium, Spain and Sweden
- ◆ Programming shared between Defense and Airbus Defense & Space
- ◆ Programme financed by dual budget (Defence and Education )

**Pleiades 1A was launched in December 2011**  
**Pleiades 1B was launched in December 2012**



# Defence and Security

## Imagery intelligence

### CSO MUSIS

*Multinational Space-based Imaging System  
for surveillance, reconnaissance and observation*

- ◆ The optical space component (CSO) of the future European MUSIS system is being developed by France, with the DGA delegating authority for the first phases to CNES
- ◆ From 2018, CSO will follow on from Helios 2, bringing improved spatial and spectral resolution and greater agility (similar to Pleiades)
- ◆ Two CSO satellites will be placed on a high orbit for reconnaissance and one on a low orbit for identification
- ◆ Cooperation with Germany and Belgium



# Defence and Security

## Imagery intelligence

### THR-NG

*Very High Resolution – New Generation*

- ◆ Studied by CNES, ministry of Defense and industry as the Pleiades follow-on
- ◆ For military and civilian requirements
- ◆ Introduce new technologies
- ◆ At the first step of the conception phase





# Defence and Security

## Electronic eavesdropping

### SIGINT

*Signals intelligence*  
*ESSAIM, ELISA, CERES*

- ◆ Ability to intercept and locate electromagnetic emissions from space
- ◆ Two demonstrators to prepare the future operational system, each consisting of four satellites from the MYRIADE series
  - ◆ **ESSAIM**: low-band radio-communications and radars (*in operation from 2005 to 2010*)
  - ◆ **ELISA**: radars (*in operation since 2012*)
- ◆ **CERES**: Operational capability for detection, characterization and location of radio-communications and radar emissions

Launch scheduled in 2020

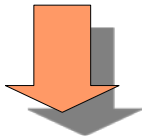
# Telecommunications

## *Sovereign Core*

MILSATCOM

Military Satellite  
Communication

## *Hardened Capacity*



Military  
use

Hardened Satellites

Operational Sovereignty

Protected Communications  
(military standards)

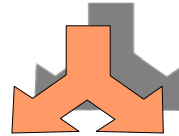
Frequency Bands:  
Governmental Use

## *Extended Core*

GOVSATCOM

Governemental Satellite  
Communication

## *Assured Access*



Military  
use

Gov.  
use

Secured Communications  
(Gov. & civil standards)

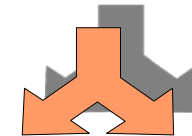
Frequency Bands:  
Gov. & Commercial Use

## *Augmentation*

COMSATCOM

Commercial Satellite  
Communication

## *Access upon availability*



Military  
customers

Gov.  
customers

Civil  
customers

Secured Communications  
(civil standards)

Frequency Bands:  
Commercial Use



### Syracuse

*A Defense telecommunications satellite*

- ◆ Specific Defense project
- ◆ Geostationary satellite operating in X band, for highly secured and anti-jammed high-speed communications
- ◆ Two follow-on satellites are to be launched from 2020

**2 Satellites launched in 2005 and 2006**



# Defence and Security

## Telecommunications

### Athena-Fidus

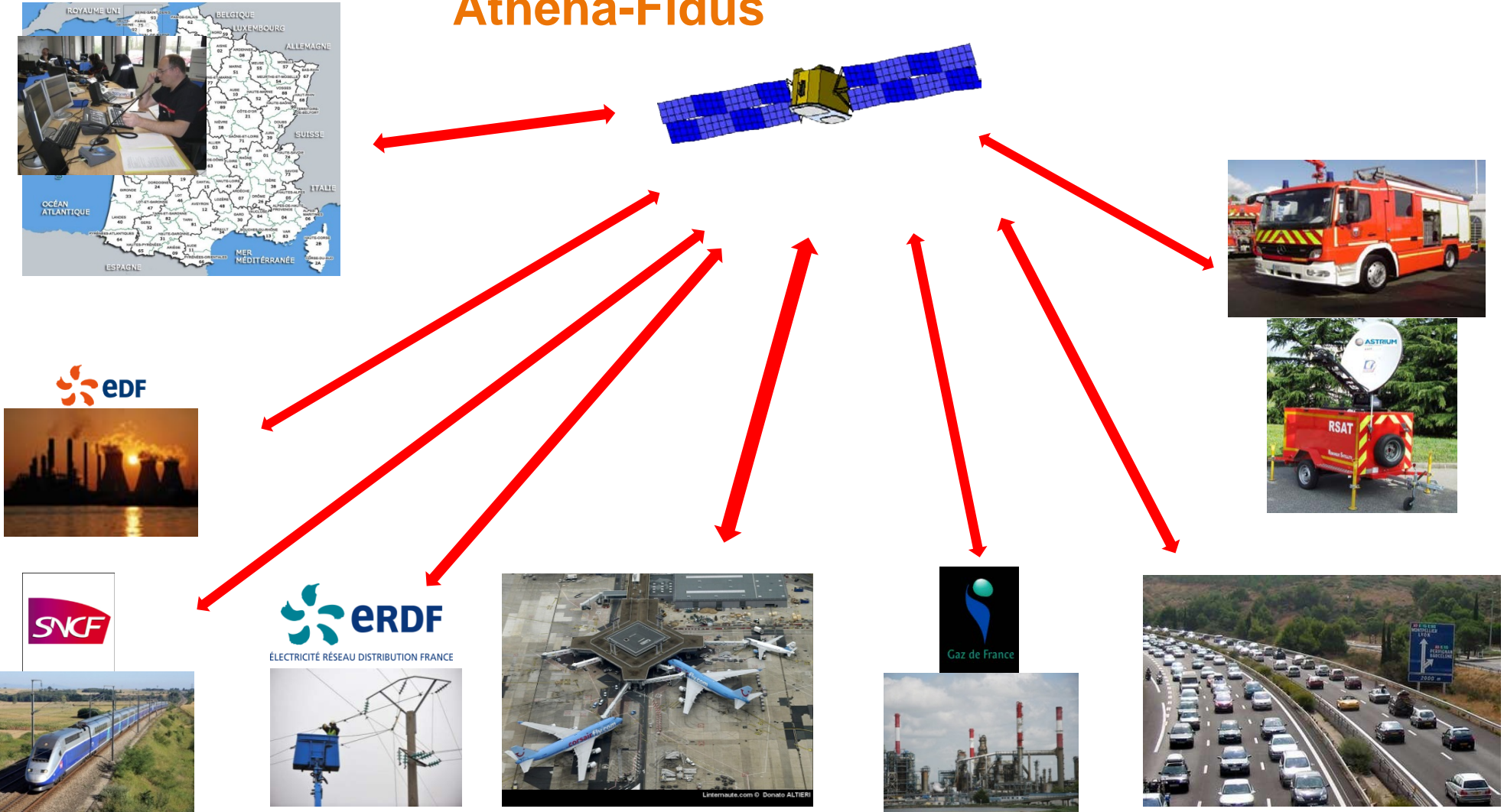
*A telecommunications satellite for defense and civil protection*

- ◆ Project in partnership with Italy for a geostationary satellite operating in Ka band, for non-secure high-speed communications with a large number of ground terminals (troops on operations, civil protection, UAV, etc.)
- ◆ Athena-Fidus is an excellent addition to the Syracuse operational Defense system
- ◆ France is involved in the GovSatCom European Commission studies with 2 people in the Expert Group

**Launched in February 2014**



## Athena-Fidus

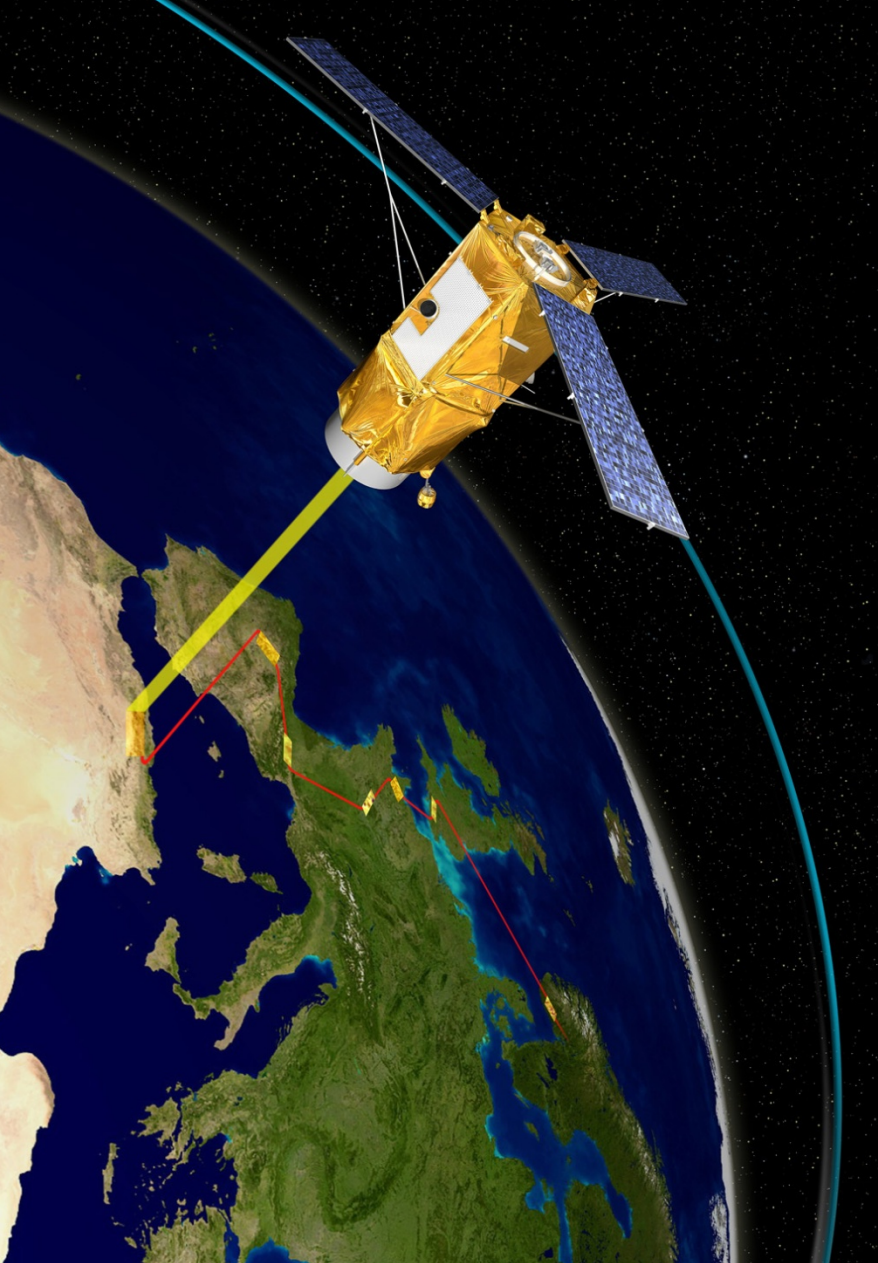




# Defense and Security

## R&T and demonstrators

- ◆ CNES implements a dynamic policy of R&T and demonstrators for both civil and defense purposes
- ◆ It aims to achieve a significant improvement in performance without increasing risks, while maintaining France's technical excellence and leadership
- ◆ Examples include **OTOS** in optics and **FAST** and **Telemak** for Telecoms



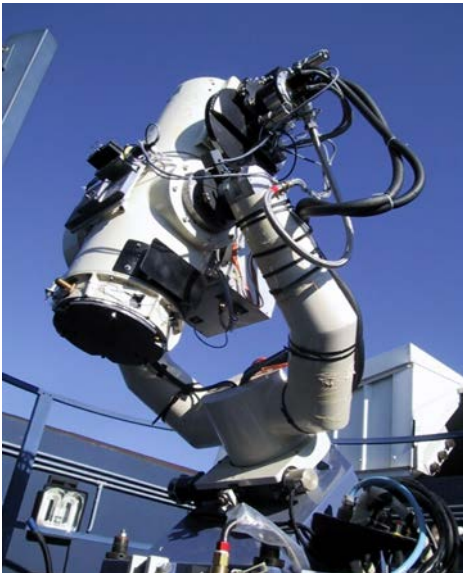


# Defense and Security

## Space surveillance



- ◆ Predicting the risks of collision in orbit : the CAESAR operational service protects satellites controlled by CNES and external clients.
- ◆ Monitoring of atmospheric re-entries and predicting the fallback zone for any debris
- ◆ Optical surveillance of the geostationary orbit with CNRS's Tarot telescopes
- ◆ Working closely with the military's organizations, in particular the French Air Force and the DGA
- ◆ Old and strong cooperation with the USA
- ◆ At the initiative, with GE, of the SST Consortium decided by the EC and the Parliament in 2014 and formalized with GE, IT, SP and UK





The background of the slide is a high-resolution satellite image of Earth from space. It shows a curved horizon of the planet, with a dark, textured surface on the left and a bright, blue, and white atmospheric layer on the right. The text "Thank you for your attention" is centered over the image in a white, sans-serif font.

**Thank you for your attention**