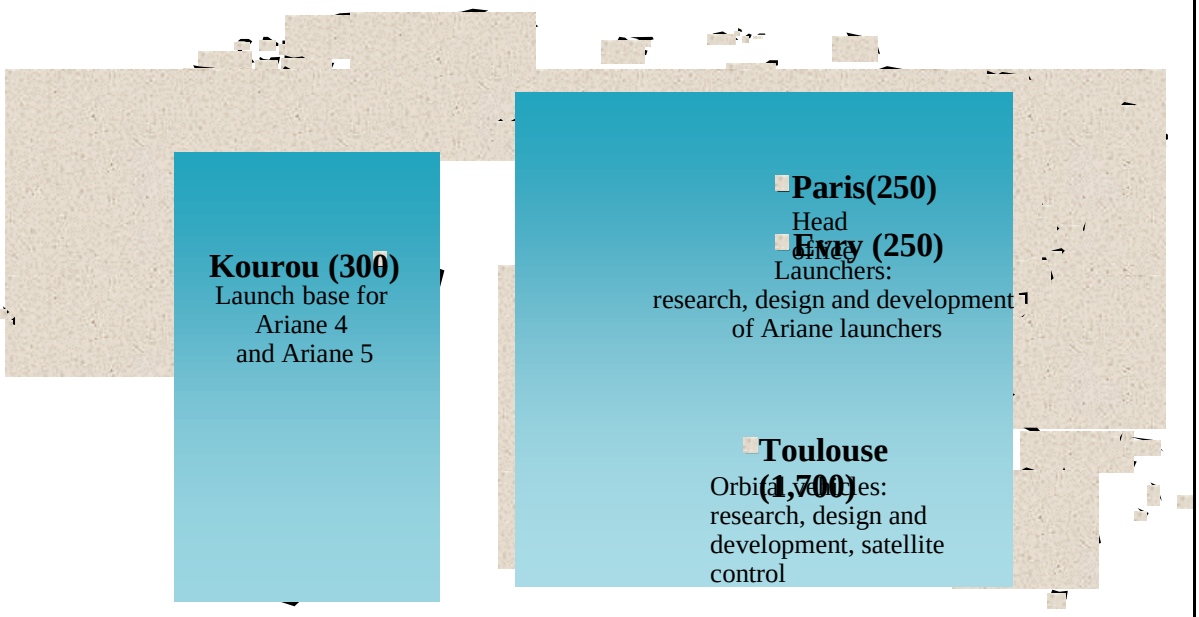
2,500 Employees in 4 centres of excellence



CNES MISSIONS

- Assists government in shaping French space policy
- Represents France at Esa and in international actions
- Develops centres of excellence in technology and space systems
  - to provide technical and mission analysis expertise for the scientific community
  - to bear the burden of risk to help industry develop certain advanced technologies
- Promotes and encourages uptake of space applications
- Provides the capacity to conduct operations for customers
- Accomplishes prestige missions

CNES budget: funds

in millions of euros	2003	2004	2005	2006
ESA contribution	640	685	685	685
National programmes	667,5	676	682	689
Total	1307,5	1361	1367	1374

ARIANE
Launchers family

Ariane 5

Soyouz

Vega

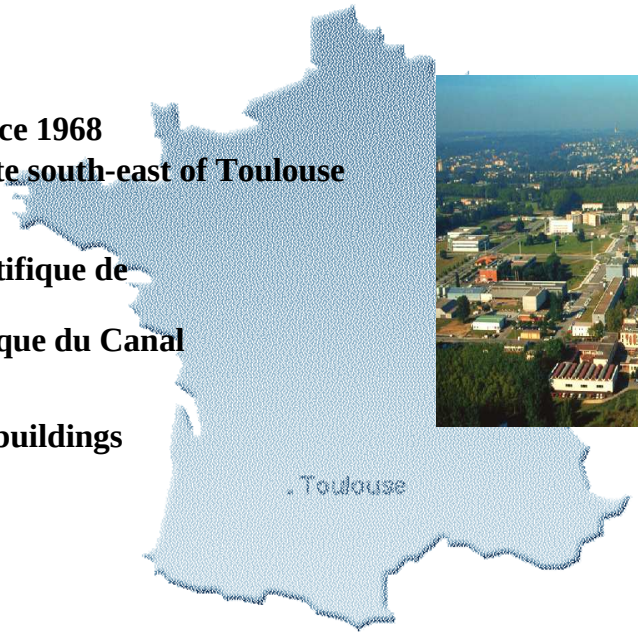
TOULOUSE SPACE CENTER

IMPLANTATION

In Toulouse since 1968
56,5 -hectare site south-east of Toulouse

Complexe scientifique de Rangueil
Parc technologique du Canal

146, 200 m2 of buildings



THE WORKFORCE

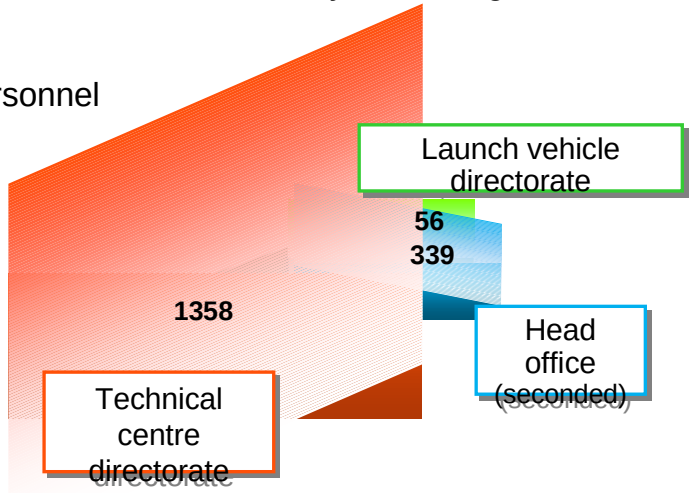
1 753 Cnes employees

⇨One of the largest institution in the Midi-Pyrenees region (space sector)

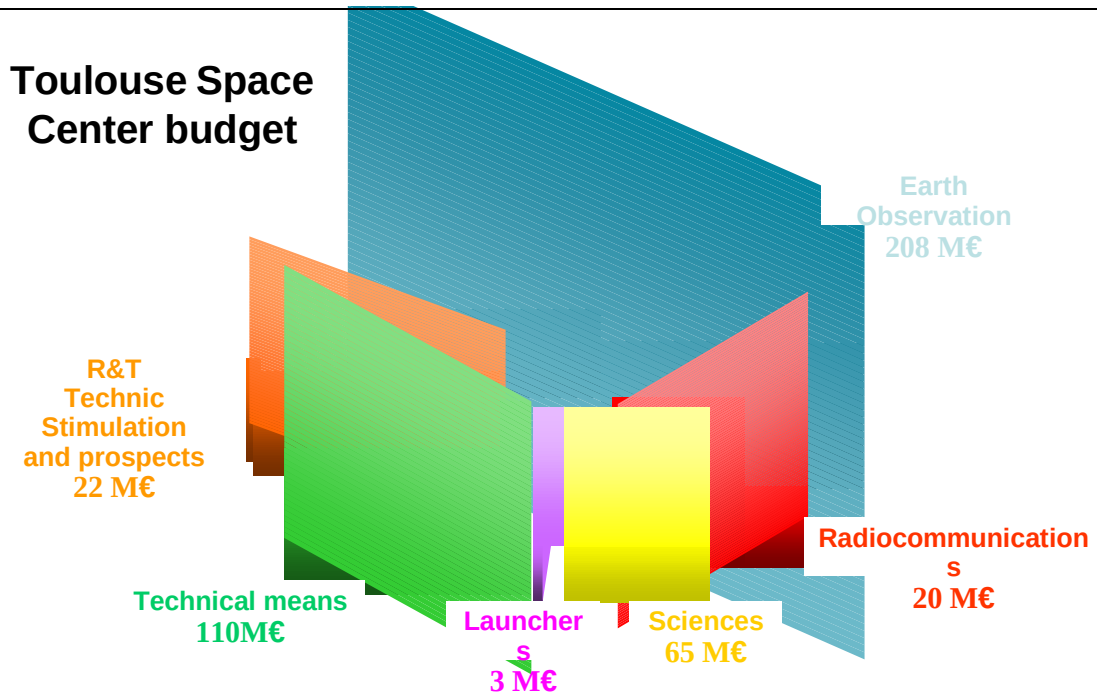
⇨ 2/3 of all Cnes personnel

⇨ 72 % engineers

⇨ Averal age: 45

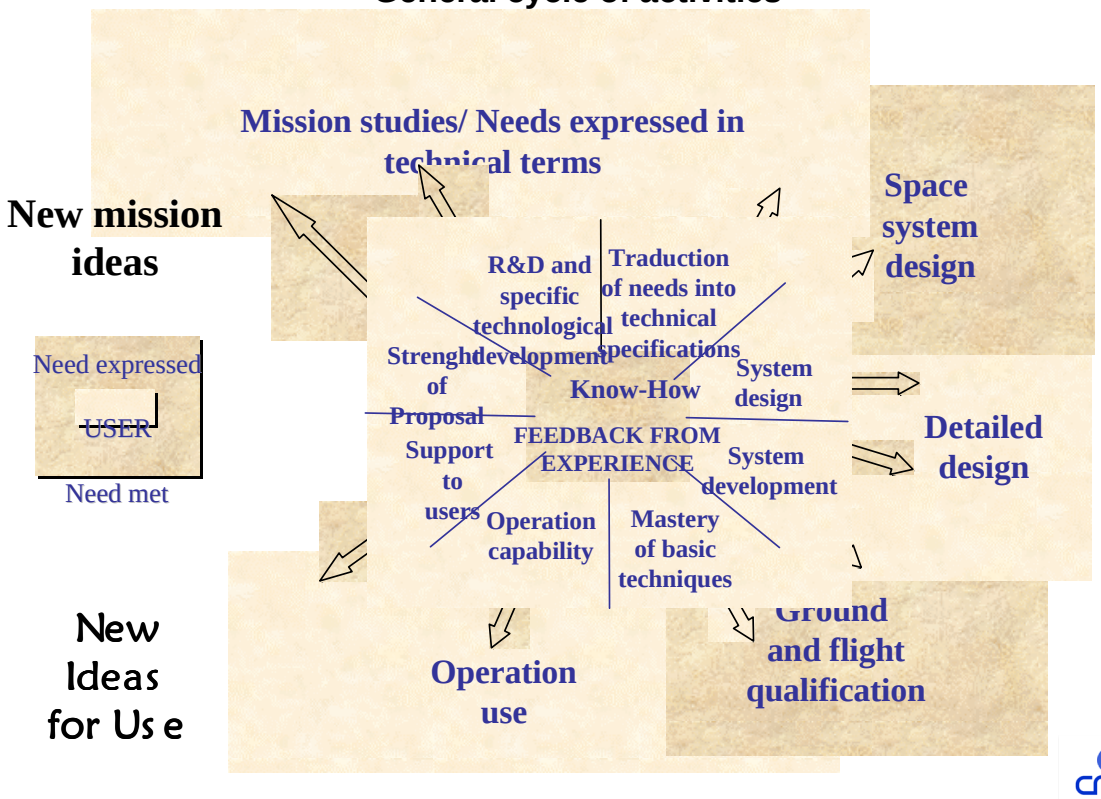


Toulouse Space Center budget



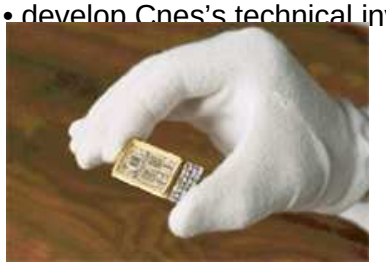
Total Budget : 425 M€

General cycle of activities



R & T,
nurturing innovation

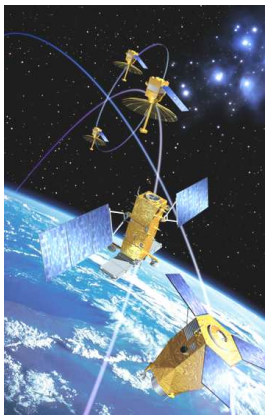
- make products and services more competitive
- prepare future projects
- develop Cnes's technical investigation capabilities





The programmes

Rosetta

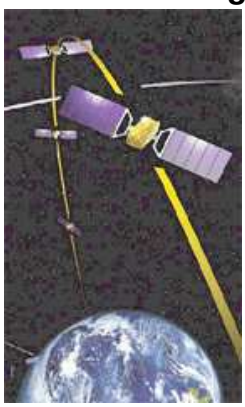


Pleiades

Integral

Jason

@bus

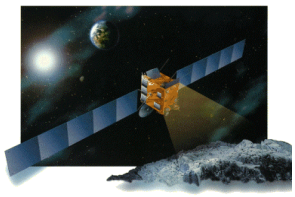


Galileo

Sciences of the Universe

ROSETTA mission

- Launched, March 3 2004
- Lander to be dropped on Churyumov-Gerasimenko
- To Study the comet 's nucleus
- Cnes / Esa / Nasa



Corot mission

Launch scheduled at the end of 2005

Stellar seismology and search for exoplanets

Partnership: Austria, Belgium, Esa, Italy, Estec, SSD Germany

Earth observation operational program

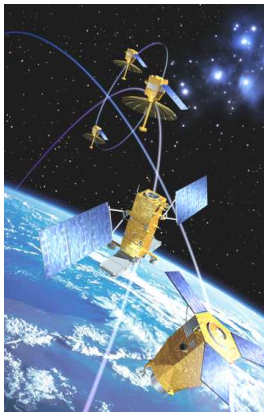
over 15 year's uninterrupted service

- SPOT 1 (86), SPOT 2 (90), SPOT 3 (93) : 10-metre resolution
- SPOT 4 (98) :
  New spectral band and Vegetation instrument
- SPOT 5: May 4, 2002
  3-metre resolution
  (+ HRS and VGT2 instruments)
- Military programmes:
  - Helios IA launched in 95,
  - Helios IB launched in 99
  - Helios 2 ready to launch in 2004

The future : PLEIADES

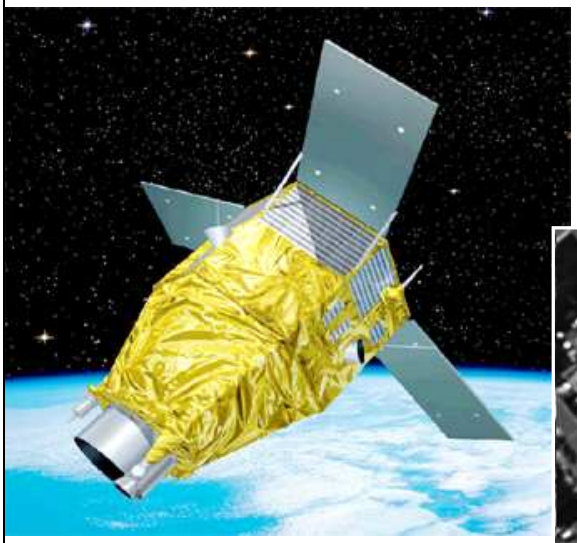
small satellite constellation

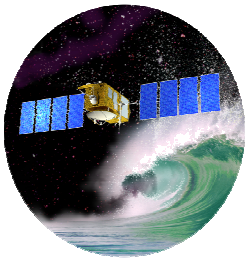
- Dual-use programme :
  - High-resolution optical and radar satellites developed jointly by France and Italy.
  - Launch scheduled in 2008



SPOT 5

The future : PLEIADES





JASON

ocean-observing system

- Topex-Poseidon follow-on
- Joint Cnes/Nasa mission
- Launched: 7th December 2001
- Real-time monitoring and forecasting of sea state and ocean currents
- Measure long-term ocean variations and their impact on climate

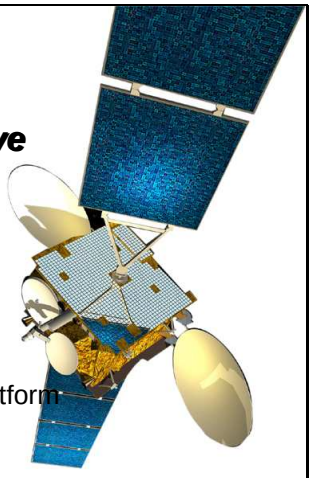
IASI

Meteorology

- IASI is a key element of the payload on the Metop series of European meteorological polar-orbiting satellites. It comprises a Fourier transform sounder and an associated imager in the infrared spectrum
- First launch in 2005
- IASI will provide meteorologists with atmospheric sounding to derive temperature and humidity with a vertical resolution of 1 km and temparature accuracy of 1 kelvin

Satellite Telecommunications

Keeping the space industry competitive



- New plans Telecom TCS21 (2007 - 2010)
  - System testbeds for prime contractors and operators
  - Development of new breaking through technologies => 7t-10t platform
  - Develop emerging technologies
- AGORA programme
  - high-speed Internet access
- Future @sat and @bus preparation programmes with ESA
  - @bus to keep our space industry competitive
  - @sat at european level

COSPAS-SARSAT

⇨Mission : localization and collect of environment data

⇨Objective : study and protection of environment

⇨Location accuracy
- 2 km at 406 MHz, 13 km at 121,5 MHz
- On average, satellites pass over each beacon 24 times a day

⇨ Installed base of beacons
- Over 135,000 transmitting at 406 MHz
- Over 590,000 transmitting at 121,5 MHz

⇨ Nearly 11,500 lives saved since 1982
- 65% at sea
- 23% from aircraft
- 12% on land

SATELLITE NAVIGATION
Joint initiative of European Commission and Esa

- Phase 1 - EGNOS :
  - The Esa/Cnes/European CAA team is based at the Toulouse space centre
  - The Toulouse space centre will host the Egnos system testbed and technical coordination centre in partnership with DNA/STNA, the French air navigation directorate and technical services
- Phase 2 - GALILEO
  - 21 satellites in medium-Earth orbit
  - 3 geostationary satellites
- Strategic and commercial issues
  - Independent European capability
  - Commercial services and terminals market

PROTEUS

The minisatellites (500kg)

- Mission
  - Life time : > 3 years
  - Attitude control :
    - 3 axis stabilization - nadir, inertial, sun pointing better than 0,05° in all directions
  - Mass memory storage for payload : 2 Gbits
  - Telemetry : 727 Kbits/s
- Payload
  - Mass: 100 to 300 kg
  - Power: up to 300 W on any orbit
  - First mission: Jason launched December 7, 2001

MYRIADE

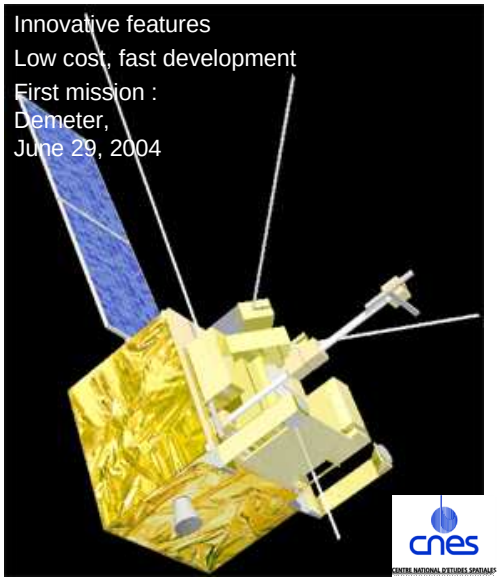
The microsatellites (120 kg)

- Suited to a wide range of missions geared towards applications, science and technology demonstrators
- Testbed for new design and manufacturing methods

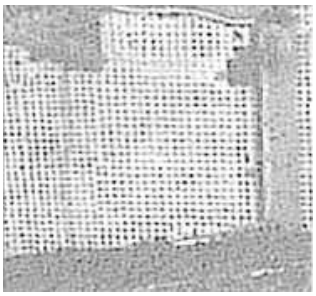
Innovative features

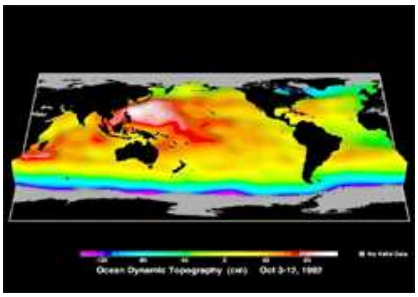
Low cost, fast development

First mission :
Demeter,
June 29, 2004



Applications





System Operations

System Operations

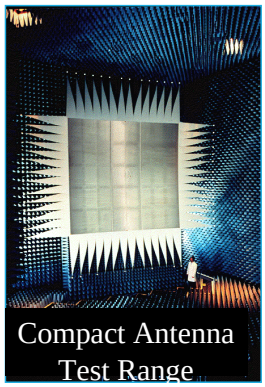
- Station-keeping now and in the near future
  - Telecommunications satellites (TC2A, 2C and 2D)
  - 5 Earth observation and Defence satellites (SPOT 2,4,5 - Hélios 1A, 1B)
  - Helios 2 in preparation
  - Jason in cooperation with JPL
- Satellite positioning for Cnes (French satellites), national and international organizations and industry
  - 52 satellites positioned today
- French mission control center of search and rescue Cospas-Sarsat operated in partnership with French civil aviation and maritim authorities
  - receives, locates and identifies distress calls

The Infrastructures

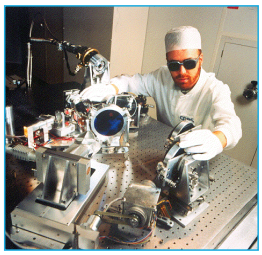

Spot control centre

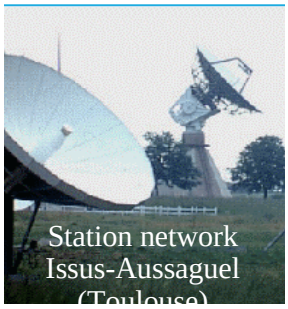

Computer centre


Balloon launch


Compact Antenna Test Range


Control centre n°1


Iasi laboratory


Station network Issus-Aussaguel (Toulouse)

Space Industry Jobs in Midi-Pyrénées

More than 8500 space-related jobs