

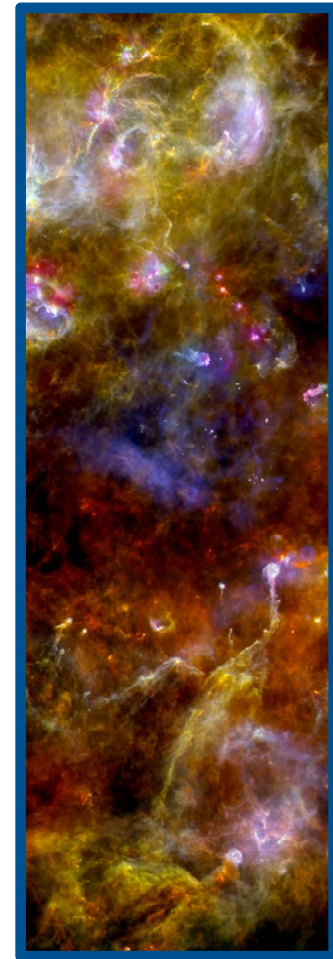
Centre National d'Études Spatiales

16th European Interparliamentary Space Conference (EICS)

Toulouse, 15 April 2014



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Space: an Ambition for France

- **1965: Diamant launches Astérix into orbit; France becomes the world's third space power**
- **1979: the first launch of Ariane; its commercial success will pave the way for the creation of the French and European space industry**
- **1986: Spot 1 is placed in orbit; France acquires an space-based observation capability for strategic and commercial purposes**
- **Ariane 5, Pléiades, Gaia; some examples of the commercial, scientific and strategic successes developed at France's initiative**



CNES, an Undisputed Standard-setter

- Founded in 1961, the Centre National d'Études Spatiales (CNES) proposes and implements French space policy
- CNES represents France at the Council of the European Space Agency (ESA), which comprises 20 European States
- CNES represents France in international bodies and supports the French space industry's exports
- CNES is the majority shareholder in a number of commercial companies, including Arianespace



Four Centres of Excellence

- CNES employs 2,444 people at four centres of excellence
- The Toulouse Space Centre (Centre spatial de Toulouse, CST), which designs orbital systems (1,758 employees)
- The Launch Vehicle Directorate (Direction des Lanceurs, DLA), which develops launch systems (227 employees)
- The Guiana Space Centre (Centre spatial Guyanais, CSG), which operates European launchers (267 employees)
- Head Office, which defines space policy (192 employees)



Five fields of Activity

- **Ariane:** to ensure independent access to space and competitiveness of launchers
- **Sciences:** fundamental physics, astrophysics, astronomy, the solar system, International Space Station utilization, etc.
- **Observation:** study of the Earth, atmosphere, meteorology, oceanography, altimetry, etc.
- **Telecommunications:** navigation, data collection, search and rescue, etc.
- **Defence:** observation, electronic intelligence, telecommunications, space surveillance, etc.



The Second-largest Budget in the World

- Annual per-capita budget allocated to civil space:
 - ◆ United States: €46
 - ◆ France: €30
 - ◆ Germany: €16
 - ◆ UK: €6
- For 2014, increased subsidy, maintaining the very high priority for space
- The 2014 CNES budget: €2,127m
 - ◆ Contribution to ESA: €811m
 - ◆ National programme: €737m
 - ◆ Programme for Investment in the Future: €111m
 - ◆ Other resources: €468m



■ The European Space Agency (ESA):

- ◆ 20 member States
- ◆ 2,200 employees, six centres of excellence
- ◆ CNES is the premier contributor to ESA's budget (€4 billion)
- ◆ ESA is CNES's primary partner in numerous programmes

■ The European Union (Lisbon Treaty):

- ◆ CNES is a proactive force in European Union programmes
- ◆ Two programmes: Galileo (positioning), Copernicus (environment)



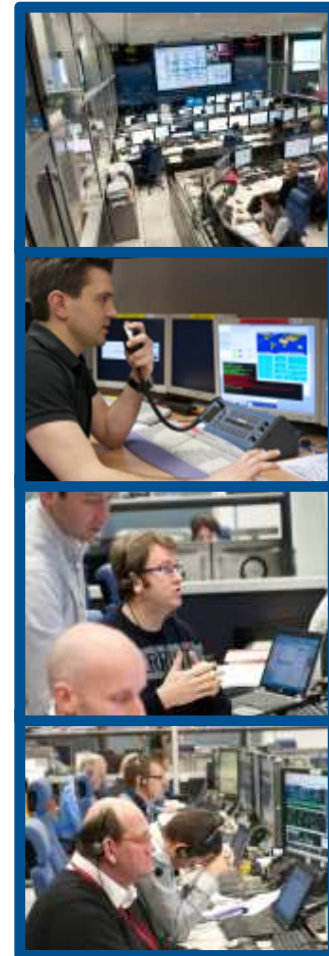
The International Challenges Facing CNES

- Numerous cooperative programmes with all of the world's space powers
- United States: oceanography (Jason 3, SWOT), rescue (Cospas-Sarsat), study of Mars (Curiosity, InSight)
- Russia: launch system (Soyuz in French Guiana), research and technology
- India: atmospheric research (Megha-Tropiques), Altimetry (SARAL-AltiKa)
- Japan: research and technology, preparing the future
- China: oceanography (CFOSat), astrophysics (Svom), space medicine (Cardiospace)



CNES and Employment

- **CNES is driving innovation for jobs: 80% of the agency's budget is invested in French industry**
- **16,000 jobs in France are in the space sector and the French space industry represents 40% of Europe's space industry**
- **The 1,700 jobs at the Guiana Space Centre generate five times more indirect jobs, or 15% of jobs in French Guiana**
- **In the commercial space sector, every €1 invested generates €20 in economic spin-off benefits**
- **Economic diplomacy: support for the industry's exports (launches, satellites, services)**



- A programme consolidating CNES goals
- Ariane
 - ♦ Launches at the Guiana Space Centre, positioning of the ATV (Toulouse)
 - ♦ Ariane 5 adaptations
 - ♦ Ariane 6
- Sciences
 - ♦ Planck results (early Universe), ChemCam and SAM (Mars) operations
 - ♦ Microscope (general relativity), Euclid (dark energy), InSight (Mars seismometer)
 - ♦ ExoMars, Cosmic Vision



■ Observation

- ♦ SARAL-AltiKa (altimetry), MetOp-B (IASI, 72-hour weather forecasting)
- ♦ Swarm (magnetic field), IASI NG (MetOp SG)
- ♦ Merlin (methane), SWOT (freshwater)

■ Telecommunications

- ♦ Galileo (positioning), Argos 3 (SARAL-AltiKa)
- ♦ Alphasat (platform)
- ♦ Neosat (electric propulsion), very high speed

■ Defence

- ♦ Pléiades (imaging),
- ♦ Athena-Fidus (telecommunications)
- ♦ CSO (observation), CERES (ELINT), Comsat NG

