French space national priorities & positions

(presentation done by the CNES President in La Sapienza di Roma, 30th May 2014)

Italian/French networking meeting, Paris, 17th June 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’Etudes 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

- **Launchers**: 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.

- **Defense**: observation, electronic intelligence, telecommunications, space surveillance, etc.
The second-largest budget/capita 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, 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 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)
Ambition 2020 (1/2)

- A programme consolidating CNES goals

- Launchers
  - Launches from the Guiana Space Centre
  - Ariane 5 and Vega 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
  - ATV operations (Toulouse Space Center)
Earth 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)
- Alphabus (platform)
- Neosat (electric propulsion), very high speed

Defense
- Pléiades (imaging)
- Athena-Fidus (telecommunications)
- CSO (observation), CERES (ELINT), Comsat NG
Italy and France in Space (1/2)
A Partnership at the Core of European Space Policy

- ESA Ministerial Council in December in Luxemburg with four main topics:
  - **Launchers**: Ariane 5 Exploitation, Ariane 6, Vega and its future (synergies with Ariane 6)
  - **International Space Station**: continue the exploitation of the International Space Station until 2020
  - **Exomars**: way ahead (Russia, funding)
  - **ESA/UE relations**: conclude the delegation agreements on GNSS and Copernicus programmes, support national industry with regard to the international competition and extend the Framework Agreement
Italy and France in Space (2/2)
A Partnership at the Core of European Space Policy

■ EU programmes and policy:
  ✷ Earth Observation: France and Italy are working together on the implementation of Copernicus
  ✷ Navigation: France and Italy are participating to Galileo
  ✷ European Space Policy: industrial policy, ESA-EU relations

■ Bilateral cooperation:
  ✷ First bilateral agreement signed in 2007 between CNES and ASI
  ✷ Earth observation: development of radar and optical satellites (CosmoSkyMed and Pleiades)
  ✷ Telecommunications:
    - Athena-Fidus: dual telecommunications satellite launched in February 2014
    - Sicral 2: satellite for military needs to be launched this year

■ Fruitful, balanced, win-win cooperation
Grazie per la vostra attenzione