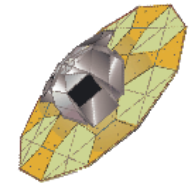
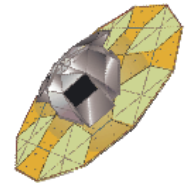


CNES involvement in GAIA scientific data processing

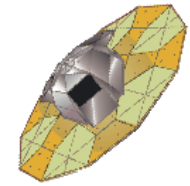
C. Huc



- CNES (Centre National d'Etudes Spatiales) is the French space agency, a state-owned and financially autonomous organization founded in 1961. Its main missions are to define and conduct French space policy
- CNES is a programme-focused agency and a centre of technical expertise,
- CNES intends to sustain its ability to design and build space systems from A to Z, through a active cooperation strategy
- Source of innovation working for and alongside French industry, science laboratories and citizens
- It conceives its actions within a broader European strategy



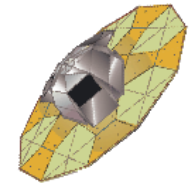
- CNES represents France at the European Space Agency (ESA) and manages France's ESA funding contribution (in 2005 €685 million)
- It conducts France's national space program to complement its partners' efforts
- CNES and its European partners are charged with achieving an optimum sharing of tasks through a network of technical centres in Europe



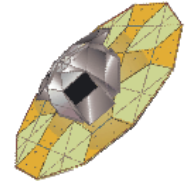
- The CNES seeks to foster bilateral links :
 - with most European nations, directly or through mixed arrangements (bilateral agreement + cooperation via ESA), such as Austria, Belgium, Germany, Italy, Norway, Spain, Sweden and Switzerland
 - with the world's leading space players: the United States (NASA), China, India, Japan and Russia
 - through targeted cooperation initiatives with many other partners around the world, including Algeria, Canada, Israel, Latin America and Thailand



CNES and international partners

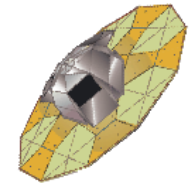


Main domains of activities

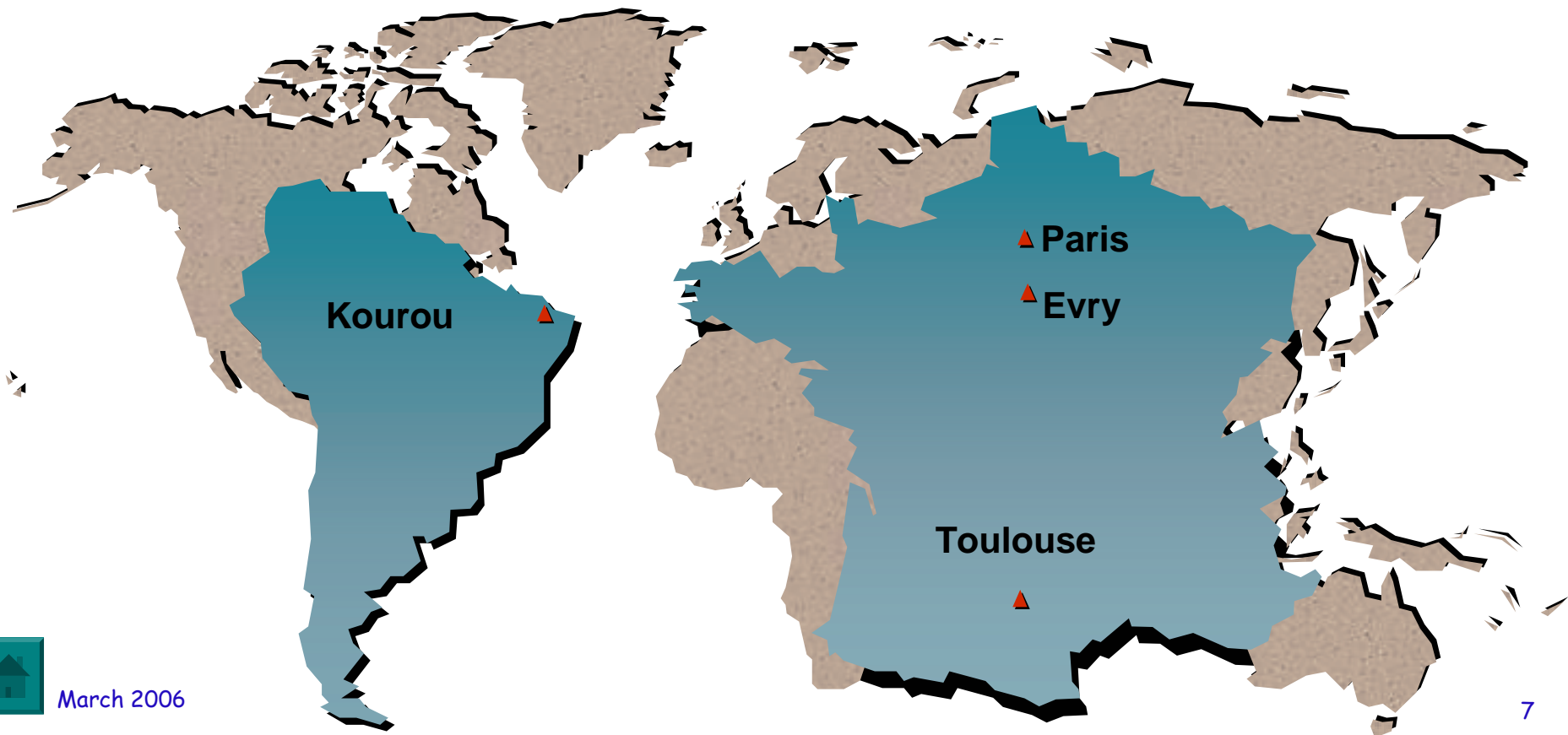


- Acces to space
 - Ariane, vega, soyuz, futur launch vehicles
- Sustainable development
 - Spot series,
 - Demeter, jason, parasol, callipso, iasi, smos, megha tropiques...
- Civils applications
 - Argos2/Sarsat2, Galileo, Egnos
- Security and defence
- Space sciences

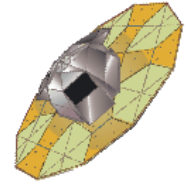
CNES at a glance



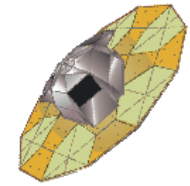
- To prepare for the future and conduct projects, CNES calls on the expertise
- at its three complementary technical field centres



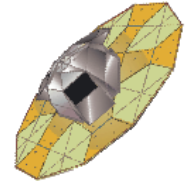
CNES at a glance



- The agency's more-than 2,400-strong workforce constitutes an large pool of skills, with some 1,800 engineers and executives, 35% of whom are women



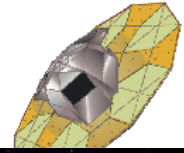
- Conducts all orbital systems projects (satellites and experiment payloads)
 - Works closely with industry and scientific research laboratories to develop complete space systems from conception through to commissioning
 - Conducts satellite positioning and orbit control operations
 - **Develops mission centers, scientific data processing systems, data access and archiving systems**



- Astronomy
- Planetology
- Sun, heliosphere, magnetosphere
- Fundamental physics
- Life and material science, human spaceflight



ASTRONOMY : Corot



Corot reaching for the stars

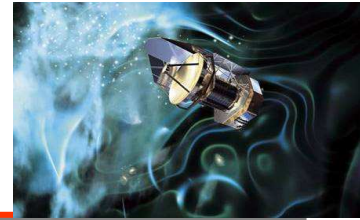
- Corot will study the inner structure of stars and hunt for planets outside the Solar System.
- National program: CNES is system prime contractor
- Launch scheduled summer 2006



March 2006



[More](#)



Herschel to explore the cold Universe – ESA project

- Astronomy mission to conduct observations in the far-infrared and submillimetre domains
 - observe the first stars and galaxies formed 12 billion years ago
 - study interstellar matter

- French instrument contributions developed by teams at the French atomic energy agency CEA and national scientific research centre CNRS, with oversight and scientific support from CNES

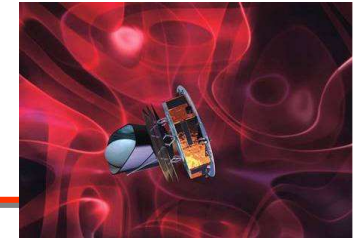
- CNES is helping to fund the mission through ESA's mandatory science programme and working on development of science data processing centres

- Launch scheduled August 2007



March 2006

[More](#)

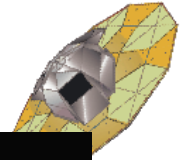


Planck Surveyor to observe the primordial Universe ESA project

- Planck Surveyor will map the cosmic microwave background with unparalleled spatial resolution and sensitivity
- The high-frequency instrument under French responsibility will observe the skies in 6 submillimetre bands
- French instrument contributions developed by teams at CNRS (IAS Orsay), with oversight and scientific support from CNES
- CNES is helping to fund the mission through ESA's mandatory science programme and working on development of science payload instruments and data processing centres
- Launch scheduled August 2007



March 2006



Miri - catching the first light of the Universe

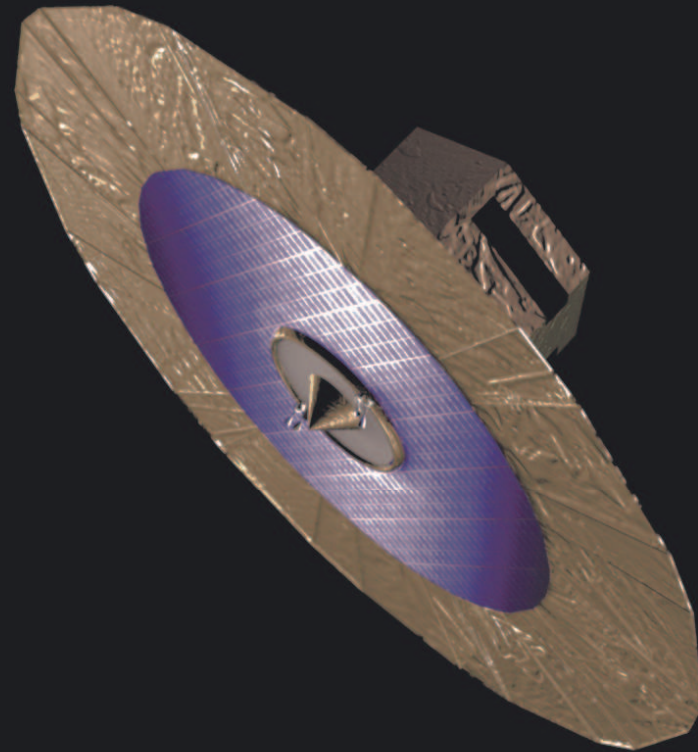
- The James Webb Space Telescope is a NASA astronomy mission with major European involvement. The successor to the Hubble Space Telescope, it is designed to determine how galaxies and stars were born, how protoplanets were formed and planetary systems evolved
- Three focal instruments and a passively-cooled telescope, including the Mid-Infrared Instrument (Miri)
- French instrument contributions developed by teams at the French atomic energy agency CEA and national scientific research centre CNRS,
- CNES is helping to fund the mission through ESA's mandatory science programme and working on development of the instrument
- Launch scheduled August 2011

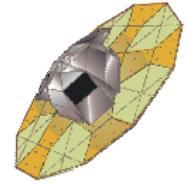


March 2006

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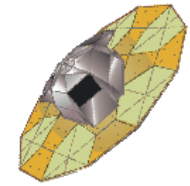
And GAIA ?



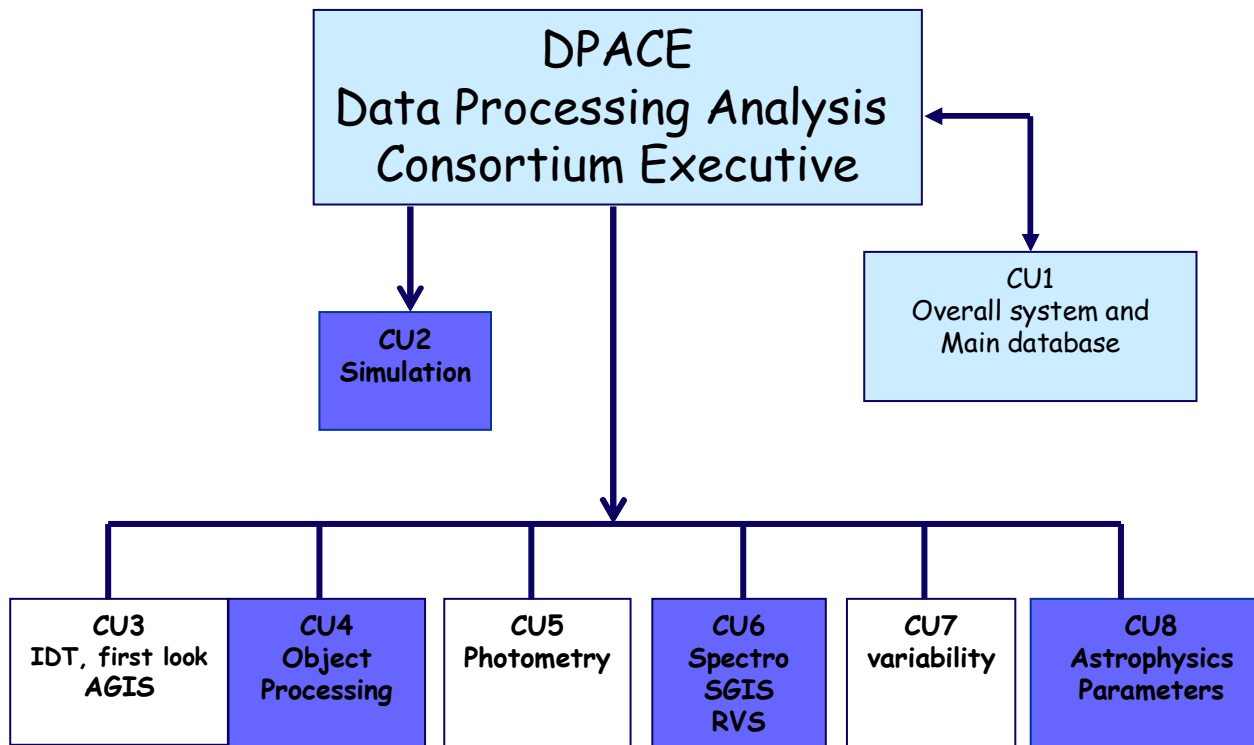
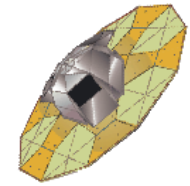


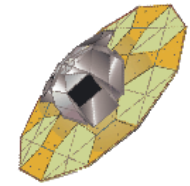
Mandate of the GAIA CNES Phase 0 in 2005 :

- To prepare
 - with the scientific community and
 - with CNES Program Directorate
- ➔ a proposal for the involvement of CNES in the Gaia data processing and submit this proposal to the CNES directory
- report and presentation before Review board : 10/05
- discussion asset-interest : October-November 2005
- final decision for the phase A now accepted with the appropriate resources

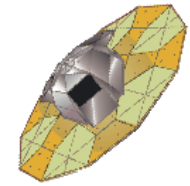


- Technical coordination and data processing centre for the integration, validation and operation of
 - **CU4 : Object processing**
 - **CU6 : Spectroscopy**
 - **CU8 : Astrophysics parameters**
- Technical coordination of CU2 and host of a service for simulated data
- Participation to system activities in CU1
- Participation to the DPACE (and therefore DACC)

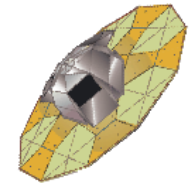




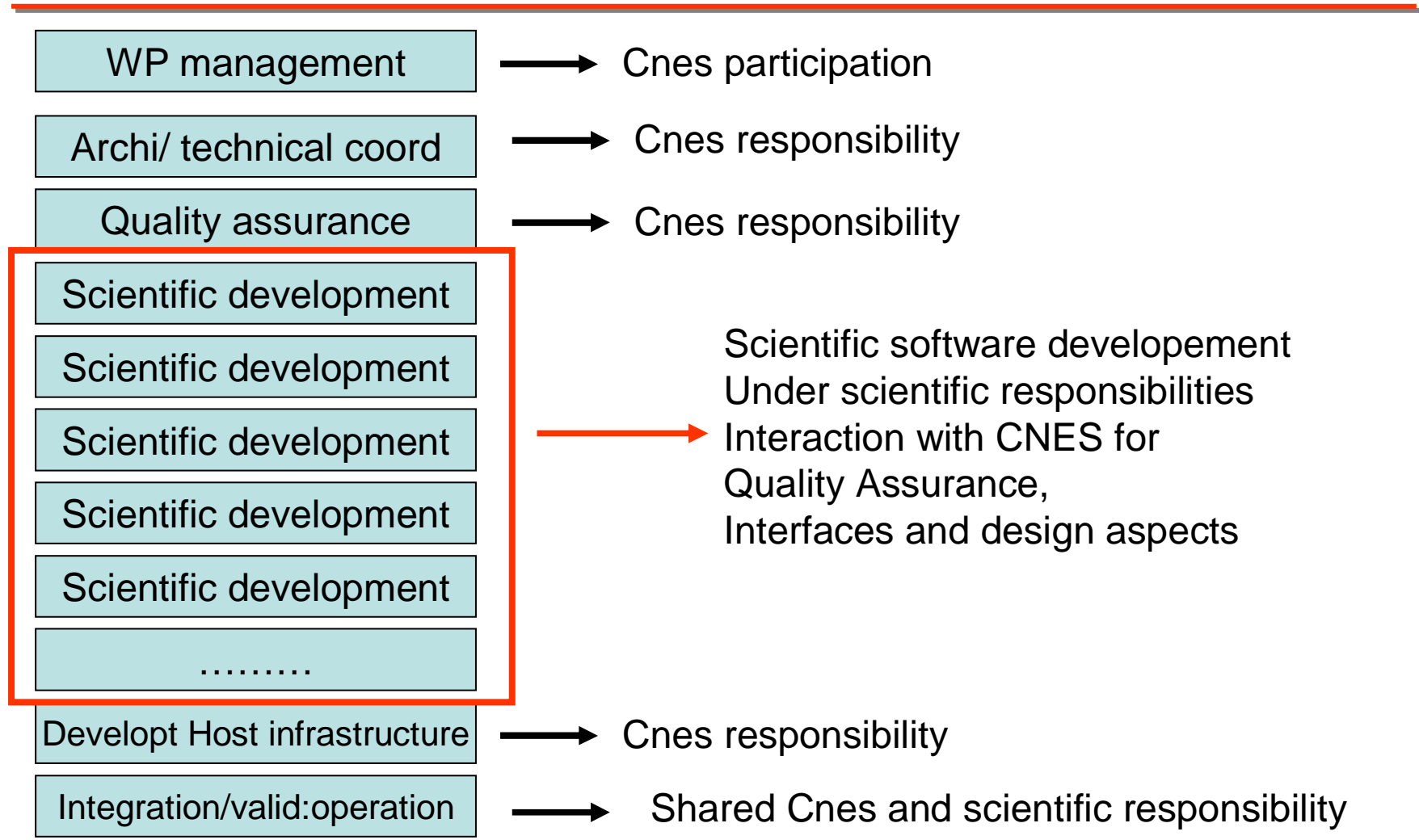
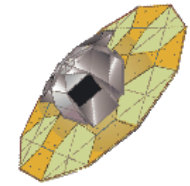
- CU1 management team :
 - W. O'Mullan, chair (ESAC)
 - T. Levoir, Deputy chair (CNES)
 - U. Lammers, deputy chair (ESAC)



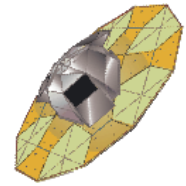
- WP management
- Wp Architecture and technical coordination for CU1
- **WP Quality Assurance and configuration management for CU1**
- WP integration, validation and operation for CU1 systems
- Coordination of common software resources
- Technology trend monitoring
- End to end testing
- **Task framework**
- Interaction with ESOC
- Main database Design/operate



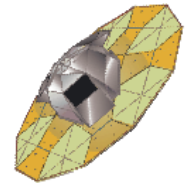
- WP management
- **Wp Architecture and technical coordination for CU2**
- **WP Quality Assurance and configuration management for CU2**
- Management and implementation of the Universe Model
- Management and implementation of the Instrument Model
- Management and implementation of GIBIS (installed and operate at CNES)
- Management and implementation of GASS (CNES involvement TBD)
- Management and implementation of GOG (CNES involvement TBD)



Cnes team structure for the 2006



-
- a project leader for the management who will be the CNES representative in the DPAC executive,
 - a system manager GAIA to take part in the Consortium system activities
 - a computer architect,
 - an engineer for the simulation activities ,
 - an engineer for the RVS activities ,
 - an engineer for the object processing and astrophysical parameters activities

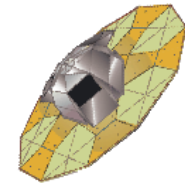


Resources evaluation

Development Phase

Human Resources

	Phase 0 CNES	Phase A CNES	Phase B1 CNES	←-----Phases B2 C et D-----> CNES					
	2005	2006	2007	2008	2009	2010	2011	2012	Total
CNES human resources for the development	1,4	7,9	9,9	10,0	8,7	8,9	9,3	9,2	65,2
	Subcontracting Human Ressources (man years) - development phase								
shell tasks (C4/C6/C8)		0,3	2,0	9,2	11,0	5,3	7,5	7,5	42,8
Shared infrastructure studies		0,8	1,2	1,2	0,3				3,5
simulation		1,0	0,3	0,2	0,1	0,1	0,1	0,1	2,0
system activities		0,3	0,3	0,3	0,1	0,1			1,1
management activities		0,2	0,2	0,2	0,2	0,2	0,2	0,2	1,4
Total for subcontracting human resources		2,6	4,0	11,1	11,7	5,7	7,8	7,8	50,8
Total of Human resources	1,4	10,5	13,9	21,1	20,4	14,5	17,1	17,0	116



CNES Human Ressources - man years

		2005	2006	2007	2008	2009	2010	2011	2012	total
tasks related to C4/C8	DCT	0,2	0,95	2	2,2	2,5	2,7	3,1	3,1	16,75
	DSI		0,1	0,4	0,6	0,45	0,45	0,2	0,1	2,3
tasks related to C6	DCT	0,2	0,8	1,5	1,9	1,85	2,1	2,3	2,1	12,75
	DSI		0,1	0,35	0,4	0,4	0,4	0,2	0,1	1,95
common tasks C4/C6/C8	DCT	0	0,65	0,6	0,3	0	0	0	0	1,55
	DSI	0,1	0,4	0,4	0,3	0	0	0	0	1,2
DCT/DSI	DCT	0,4	2,4	4,1	4,4	4,35	4,8	5,4	5,2	31,05
	DSI	0,1	0,6	1,15	1,3	0,85	0,85	0,4	0,2	5,45
TOTAL		0,5	3	5,25	5,7	5,2	5,65	5,8	5,4	36,5