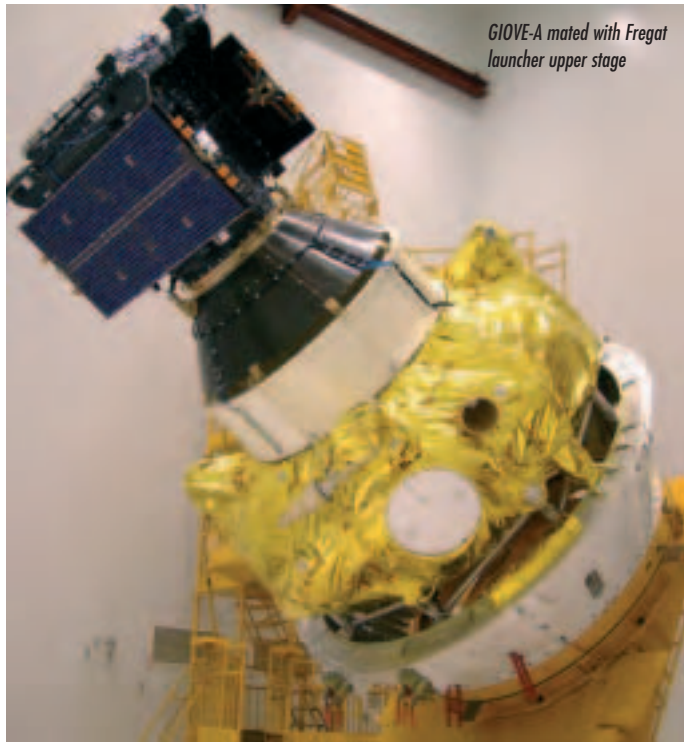
In Brief

GIOVE-A Transmits the First Galileo Signals

The GIOVE-A satellite is in good health and started transmitting the first Galileo signals on 12 January.

GIOVE-A (Galileo In-Orbit Validation Element) was placed in orbit by a Soyuz-Fregat rocket on 28 December from the Baikonur cosmodrome. Following a textbook lift-off at 05:19 UTC, the Fregat upper stage performed a series of manoeuvres to reach a circular orbit at an altitude of 23 258 km, inclined at 56 degrees to the equator, before safely deploying the satellite. The prime contractor, Surrey Satellite Technology Ltd. (UK), then opened the 7-metre solar array panels, commissioned the satellite platform and prepared the payload for tests from its Mission Control Centre.



GIOVE-A mated with Fregat launcher upper stage

On 12 January, the first Galileo navigation signals were transmitted by GIOVE-A. These were received and analysed by the Galileo receivers using the 25-metre diameter dish of the Chilbolton Observatory Facilities for Atmospheric and Radio Research (UK) and the ESA Station in Redu (B). The various Galileo signal modes will now be generated sequentially using the various GIOVE-A payload chains. Payload commissioning activities are planned to be completed by mid-February. Additional measurement campaigns will then be carried out to assess the medium-Earth-orbit radiation environment, characterise the performance of the onboard clocks and perform signal-in-space experimentation.

GIOVE-A is the first element of the Galileo In-Orbit Validation phase. This pilot satellite marks the very first step towards Europe's new global navigation satellite system, a partnership project involving the European Space Agency and the European Commission.

GIOVE-A's mission is to secure use of the frequencies allocated by the International Telecommunications Union (ITU) for the Galileo system, demonstrate critical technologies for the navigation payloads of future operational Galileo satellites, characterise the radiation environment of the orbits planned for the Galileo constellation and test the receivers on the ground. Galileo will be Europe's very own global navigation satellite system, providing a highly accurate and guaranteed positioning service under civilian control. It will be inter-operable with the two other systems: the US Global Positioning System (GPS) and Russia's Global Navigation Satellite System (Glonass). Galileo will deliver real-time positioning services with unrivalled accuracy and integrity.

A second satellite, Giove-B, built by the European consortium Galileo Industries, is currently in preparation. It will demonstrate the Passive Hydrogen Maser (PHM), which with a stability of better than 1 nano-second per day will be the most accurate atomic clock ever launched into orbit. Two PHMs will be used as primary clocks onboard the operational Galileo satellites, with two rubidium clocks serving as backups.

Subsequently, four operational satellites will be launched to validate the basic Galileo space and related ground segments. The contract for this key phase was signed on 19 January in Berlin with Galileo Industries. Once this In-Orbit Validation (IOV) phase is completed, the remaining satellites will be launched to achieve the Full Operational Capability (FOC).

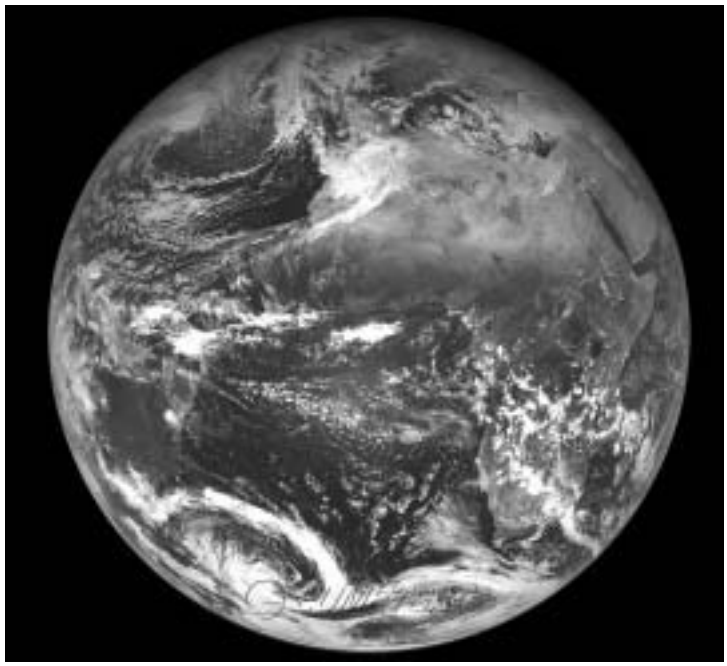
esa

The Soyuz carrying GIOVE-A lifted off on 28 December

Witnessing Global Climate Change: MSG-2 Successfully Launched

The second member of Europe's new generation of weather satellites has been successfully lifted into orbit by an Ariane-5 launcher. This ninth Meteosat satellite has been developed by ESA on behalf of Eumetsat, the European meteorological satellite organisation.

MSG-2 (the second flight model of Meteosat Second Generation) was one of the two payloads of Ariane-5's latest launch on 21 December. The European launch vehicle lifted off from the Guiana Space Centre, Europe's spaceport, in Kourou, French Guiana, at 19:33 local time and safely delivered its two passenger payloads into a geostationary transfer orbit (GTO). Under the control of ESA's European Space Operations Centre (ESOC) in Darmstadt (D), MSG-2 successfully performed a series of orbital manoeuvres using its onboard propulsion system in order to circularise its orbit at geostationary altitude. It will now undergo several months of in-orbit commissioning before being declared operational in summer 2006 and entering operational service over the Gulf of Guinea.



The first image recorded by MSG-2/Meteosat-9 in visible light at 13:00 UT on 24 January 2006

The launch of MSG-2 from the European spaceport in Kourou, French Guiana, at 19:33 local time (23:33 CET) on 21 December

MSG-2 is the first of three satellites based on the same concept, designed to improve the provision of essential data and information for operational weather forecasting and sustainable development. The new Meteosats are configured to observe the Earth in twelve spectral bands and to deliver visible, infrared and water-vapour spectral-wavelength images, with a ground resolution of 1 km.

Once operational, therefore, and renamed Meteosat-9, MSG-2 will replace Meteosat-8 as the primary satellite for monitoring the Earth's atmosphere and climate. Meteosat-8 will then be moved to 3.4°W as a back-up satellite to ensure continuity of service under unforeseen circumstances. In addition, Eumetsat is still operating the first-generation Meteosat-5, 6 and 7 satellites provided by ESA. With two more satellites currently ordered, the MSG series should provide coverage until at least 2018. The data that the Meteosats are providing are a unique record in terms of the evolution of our planet's climate over nearly three decades and its consequences for our weather.

esa

Science, Sun and New Friends: The ESA Space Camp

The annual Space Camp for around 130-150 children of ESA staff aged from 8 to17 has always been a very successful and increasingly popular inter-Establishment activity. The Space Camp is an exceptional forum for ESA children to bring families of different Establishments together, learn about space in general and ESA's activities in particular, including why ESA families sometimes need to move from one Establishment to another. ESA has centres in a number of European countries. The ESA space camp children are young Europeans with intercultural experiences and knowledge who are keen on space.

Models made by students exhibited during the Space Nights

Every summer the Space Camp takes place in a different ESA Member State. It culminates in the ESA Astronaut Day event, to which local media are also invited. For several years, ESRIN's Public and Institutional Relations Office has been providing material and support for the Space Camp's organisation.

The major nationalities and group languages of the 2005 Space Camp in Portugal were French, Italian and German. As usual, nearly all of the children were bilingual, and many were even trilingual. The children who came from other Member States such as the Netherlands, Spain or the United Kingdom could always find a way to communicate within their group and with their group leaders. English was the common language for many who have lived in more than one European country.

The Activities

The Camp's activities were based on local culture, history and science education. Overall there was an excellent mix of fun and education, leisure and learning, challenge, adventure and holiday. In particular, the children enjoyed:

- Lectures on the history of great Portuguese nautical explorers who discovered other continents, e.g. Dom Henrique, Fernando Magalhães, Vasco da Gama, Pedro Alvares Cabral.
- The Tavira Camera Obscura, a magical 360 degree voyage through Tavira and its surroundings hosed in a former water tower.
- A Galileo and EGNOS related activity about time and a GPS-receiver-based scavenger hunt.
- A fun and challenging treasure hunt.
- A mobile planetarium with an astro-navigation presentation.
- The Science and Space Fair, which offered the children the possibility to conduct scientific experiments.
- The Ciência Viva science centre in Tavira.
- The sports area where the children practised their sailing, canoeing, aqua-gym, basketball, volleyball, and climbing skills.

"What a wonderful camp!!!! "I will miss you all so much!!! SPACE CAMP is so cool!!!" "J'suis trop triste de vous Ki-T." "T.V.B. (ti voglio bene) ... e ho detto tutto..." "Le Space Camp au Portugal c'était SUPER, le meilleur de TOUS! Le seul truc énervant c'est qu'on peut pas rester PLUS LONGTEMPS ."
..... just some of the comments of the multilingual 'ESA campers' on the last day of the 'Navigation from Sea to Space' adventure camp, held in Tavira, Algarve, Portugal from 23 July to 3 August 2005.

Another highlight of the Space Camp were the 'Science Nights', a two-day event that takes place every year in Portugal, which promotes science during the summer holidays. This year's event was organised by Ciência Viva, the Portuguese National Programme for Science, in collaboration with the Town Council of Tavira and ESA. During both nights Michel Tognini, Head of the ESA Astronaut Centre in Cologne (D), R. Lucas Rodriguez, working in ESA's Navigation Department at ESTEC (NL) and C. Moura Cruz from the ESA Country Desk for Portugal at ESRIN (I) presented ESA's activities, focussing in particular on the Human Spaceflight, EGNOS and Galileo Programmes. The Portuguese Minister for Science, Technology and Higher Education Jose Mariano Gago, and the Head of Ciência Viva Rosália Vargas, attended the event and visited the Science Fair that was organised to let participants try several scientific experiments themselves.

The ESA Communications Country Desk for Portugal set up a stand in the old market place in Tavira for the local community and visiting tourists. The Space Camp participants also acted as ambassadors for ESA and the European youth of today by showing and explaining the experiments they had constructed in the Ciência Viva Centre.

Looking to the Future

The ESA Space Camp is an ideal way to bring together truly 'European' youngsters and to experiment with new didactic material in various European languages. It combines raising awareness of space issues with a multilingual holiday education experience, and it can also spin-off fascinating space-education projects for other national organisations.

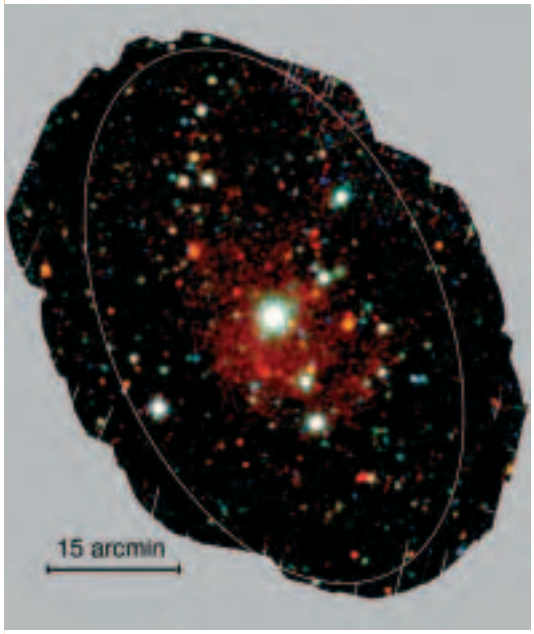
Science on holiday can be an enjoyable experience

Preparations are already underway for the next Space Camp, which will take place in Greece from 18 to 31 July 2006, with the theme 'From Argonauts to Astronauts', highlighting man's spirit of exploration through the centuries. Further information can be found at: ccc@esa.int.

esa

Susanna Attolico, Simonetta Cheli & Clara Moura Cruz, ESA/ESRIN

1000th XMM-Newton Scientific Paper Published



This X-ray image, showing a mosaic of the spiral galaxy M33, was taken by the X-ray imaging cameras on board ESA's XMM-Newton in August 2000. The ellipse delimits the area of the optical view of this galaxy. Credit: W. Pietsch, MPE (D) and ESA

XMM-Newton, ESA's scientific X-ray observatory mission, continues its quest to unravel the unknowns in our Universe. In January, after just five years of operations, the mission saw the publication of the 1000th scientific paper based on XMM-Newton data in top-class scientific journals.

There are several ways to measure the scientific success of a mission. One is certainly to look at the use the scientific community makes of the data obtained by a particular spacecraft, and at the number, novelty and significance of the results so produced.

From the very beginning of its operation in early 2000, hundreds of scientists all around the World have been eagerly 'booking' observing time with XMM-Newton, gathering data and searching for new clues about the hidden and powerful phenomena taking place in the Universe, not least about black holes, the births and deaths of stars, and active galactic nuclei. As a result, scientific findings based on XMM-Newton observations are now being published at a steady rate of almost 300 papers per year, which is comparable with the scientific output of the famous Hubble Space Telescope.

XMM-Newton was launched on 10 December 1999. In November 2005, the mission was extended until 31 March 2010. A further review of the mission's scientific performance and operational status will take place around autumn 2007. esa

Herschel and Planck to be Launched by Ariane

During a ceremony at ESA Headquarters in Paris on 13 December, the Agency signed a contract with Arianespace for the provision of an Ariane-5 ECA launcher for the Herschel and Planck scientific spacecraft. Herschel will study the birth of galaxies and stars and Planck the very early history of the Universe. The Ariane-5 ECA is an upgraded version of the previous Ariane-5 G ('generic') launcher. Herschel and Planck will be launched by the so-called 'long-fairing' version of Ariane-5 ECA in order to accommodate the two spacecraft, which are 7.5 metres and 4.2 metres high, respectively, and will have a total launch mass of 5.3 tons.

The launcher will deliver both spacecraft into a transfer orbit on route to their final observation site – an orbit around the second Lagrangian point (L2) situated 1.5 million kilometres from Earth away from the Sun. The launch is currently scheduled for late 2007/early 2008. esa

ESA Director General Jean-Jacques Dordain and Jean-Yves Le Gall of Arianespace signing the launch contract for Herschel and Planck