

In Brief

Rosetta begins its ten-year journey

Europe's Rosetta cometary probe has been successfully launched into an orbit around the Sun, which will allow it to reach the comet 67P/Churyumov-Gerasimenko in 2014, after three flybys of the Earth and one of Mars. During this ten-year journey, the probe will pass close to at least one asteroid.

Rosetta's mission began at 08:17 CET (07:17 GMT) on 2 March when its Ariane-5 launch vehicle lifted off from Europe's spaceport in Kourou, French Guiana. The launcher successfully placed its upper stage and payload into an eccentric coast orbit (200 x 4000 km). About two hours later, at 10:14 CET (09:14 GMT), the upper stage ignited its own engine to reach the escape velocity needed to leave the Earth's gravity field and enter heliocentric orbit. The Rosetta probe was released 18 minutes later.

"After the recent success of Mars Express, Europe is now heading to deep space with another fantastic mission. We will have to be patient, as the rendezvous with the comet will not take place until ten years from now, but I think it's worth the wait" said ESA's Director General Jean-Jacques Dordain after the launch.

ESA's Operations Centre (ESOC) in Darmstadt, Germany, which will be in charge of Rosetta orbit determination and operations throughout the mission, established contact with the probe immediately after launch as it flew away from the Earth at a relative speed of about 3.4 km/s. During the next eight months, the spacecraft's onboard systems will be checked and its science payload will be commissioned. It will then be put into 'hibernation mode' for most of the ten years of its journey through the Solar System. Rosetta will be reactivated for planetary flybys, which will be used to modify its trajectory through gravity-assist manoeuvres, or asteroid flybys, observation of asteroids being one of the mission's secondary objectives.

The first planetary encounter will be in March 2005, as Rosetta flies by the Earth for the first time. The resulting 'gravity assist' will boost Rosetta into an orbit that will take it on to Mars two years later. During its close encounter with Mars in February 2007, Rosetta will approach to within about 200 km of the planet and conduct scientific observations. This Martian flyby will be followed by a second Earth flyby in November of the same year. Both planetary encounters will increase the spacecraft's orbital energy and boost it well into the asteroid belt. A third and last flyby of the Earth in November 2009 will send Rosetta towards the orbit of comet Churyumov-Gerasimenko.



Rosetta lander named 'Philae'

A few weeks before the Rosetta launch, the spacecraft's lander was named 'Philae'. Philae is the island in the river Nile on which an obelisk was found that has a bilingual inscription including the names of Cleopatra and Ptolemy in Egyptian hieroglyphs. This provided the French historian Jean-François Champollion with the final clues that enabled him to decipher the hieroglyphs on the Rosetta Stone and unlock the secrets of ancient Egyptian civilisation. Fittingly, the Philae lander and the Rosetta orbiter have been designed to unlock the mysteries of comets, the oldest building blocks of our Solar System.

The main contributors to the building of the lander - Germany, France, Italy and Hungary, working together with Austria, Finland, Ireland and the United Kingdom - held national competitions to select an appropriate name for it. 'Philae' was proposed by 15-year-old Serena Olga Vismara from Arluno, near Milan (I). Her hobbies are reading and surfing the internet, from which she got the idea of calling the lander 'Philae'. Her prize was a visit to Kourou to attend the Rosetta launch.



UK and ESA announce Beagle 2 inquiry

Beagle 2, the British-built element of ESA's Mars Express mission, has failed to communicate since its first radio contact was missed shortly after it was due to land on Mars on Christmas Day. The Beagle 2 Management Board met in London on Friday 6 February and, following an assessment of the situation, declared the Beagle 2 lander lost.

On 11 February, the UK Science Minister Lord Sainsbury and ESA announced that an ESA/UK inquiry would be held into the failure of Beagle 2. Lord Sainsbury, of the UK Department of Trade and Industry, said: *"I believe such an inquiry will be very useful. The reasons identified by the Inquiry Board will allow the experience gained from Beagle 2 to be used for the benefit of future European planetary exploration missions."*

The Inquiry Board, which will report by the end of March, is to be chaired by the ESA Inspector General, René Bonnefoy. The UK deputy chairman will be David Link MBE, a former Director of Science and Radar Observation at Matra Marconi Space, now EADS-UK. 

Cooperation agreement signed between ESA, Hungary and the Czech Republic

Hungary and the Czech Republic have signed European Cooperating State (ECS) agreements with ESA. Both countries will now be able to participate in nearly all ESA programmes. Hungary has even finalised its specific plan for collaboration and signed the "PECS" document – Plan of space collaboration activities for European Cooperating States. Both States will make an annual payment to ESA. Initially they will each contribute with 5 million Euro over a five-year period. 93% of this contribution will be returned to each country in the form of contracts to its industry and research institutes. The remaining 7% is an administration fee to ESA to cover the cost of integrating these two countries into the Agency. 

ESA/Inmarsat agreement to improve satellite mobile phone and data services

An agreement signed by ESA and Inmarsat brings the reality of reliable mobile broadband communications services a step closer. For the first time, global mobile broadband services will be available for those at sea, in a plane or travelling on land virtually anywhere in the world.

This agreement marks the first collaboration between ESA and Inmarsat on system engineering activities and will extend the capabilities of the new Broadband Global Area Network System (BGAN) to be offered by the Inmarsat I-4 satellite constellation.

Following the launch of the first of the fourth-generation Inmarsat satellites in 2004, BGAN is expected to become operational for land services in 2005. Applications will include internet and intranet access, video on demand, web TV, video-conferencing, fax, e-mail and LAN access at speeds of up to 432 kbit/s from notebook-sized terminals almost anywhere in the world. The BGAN system will be compatible with third-generation (3G) cellular terrestrial systems and the project will adopt an 'Open Standards' approach.

Under the terms of the agreement, ESA has agreed to fund 50% of the project and to provide technical support. A number of companies will be involved in this agreement. EMS Satcom Ltd. (UK) is in charge of developing the aeronautical mobile platforms, Logica CMG (UK) will mainly be involved in multicast service-centre development, and the Norwegian company NERA ASA will be responsible for developing maritime platforms. The University of Surrey (UK) will work on BGAN performance analysis. 

Space Policy Institute founded

The new European Space Policy Institute, founded by ESA and the Austrian Space Agency, will create a virtual network of think tanks to promote European space policy in the world. It will be located in Vienna, Austria, and legally represented by a Secretary General. The tasks of the institute are building up know-how to provide comprehensive and independent policy research to space players in Europe, and identifying and developing research themes to initiate, support and promote debate to raise public awareness of the importance of space-based infrastructures and services. 

Aurora student design contest

'Aurora' is the name of ESA's initiative for robotic and human exploration of the Solar System and notably of Mars and the Moon. The Programme – currently in its preparatory phase – will define and implement a long-term exploration strategy with the final goal of landing a human on Mars by 2030. The road map that is being worked out includes a number of technology developments, robotic missions to Mars and manned and unmanned missions to the Moon in preparation for a human mission to Mars. A programme with such ambitious goals and spanning such a long period of time needs to ensure that there will be a constant in-flow of new ideas and concepts, as well as a new skilled and motivated workforce. This is why Aurora has an explicit provision for co-operation with European Technical Universities.

Aurora already has close relations with European University networks and the Future Space Exploration (FUSE) network that brings together top European universities with an interest and expertise in space exploration. The idea of a Student Design Contest was launched at the first Aurora/Academia Workshop, held in September 2002.

The contest is intended to:

- raise awareness and motivate students and young researchers concerning the issues of space exploration and the challenges that go with it, while offering an opportunity to tackle a design project with given requirements and in a given framework;
- stimulate new ideas, innovative concepts and unexplored approaches that can spring from the academic environment and that could later be applied to the missions or facilitate the solution of related technical problems.

The above goals match the mandate and objectives of the ESA Corporate Education Office, in cooperation with which the contest was launched and conducted.

The first deadline, for team registration and submission of a project outline, was the beginning of March 2003. Teams could be composed of a maximum of six students including one PhD candidate. The project outline was meant to make sure students had understood the scope of the contest and the Aurora Programme, as well as the five categories in which projects could be submitted. These were 'Flagship' and 'Arrow' class missions (major missions with a scientific interest in their own right, and smaller, cost-capped, mainly technology demonstrator missions, respectively); 'Human Missions'; 'New Enabling Technologies' and 'Surface Robotics'.

By the first deadline, 53 projects had been received. Once the teams had been notified that their project was eligible for the contest, they had five months in which to work on it and come up with a 20-page report and an executive summary to be submitted no later than the end of July 2003.

In the end, 36 projects were entered, which triggered a very intense reading, evaluation, discussion and selection process that occupied more than ten people from the Aurora Programme and ESA's Advanced Concept Team for one week. The quality of the work produced by the students was deemed to be so good that, in addition to the top three projects for each category, two additional projects were shortlisted in the 'Human Missions' category. Finally, 17 teams were selected to go to Barcelona and present their projects to ESA experts and members of the Exploration Programme Advisory Committee (EPAC) with representatives from industry and academia.



Students presenting their projects at the first Aurora Student Design Contest

The event was a great success, also thanks to the flawless organisation by the Universitat Politecnica de Catalunya. The jury's task to identify the winners in the five categories was not an easy one. Chaired by the EPAC Chairman, Prof. J.P. Swings, the jury finally awarded 11 prizes in total – two more than planned – and congratulated all students for their excellent work. While the students are resting from their efforts and looking forward to enjoying their prizes, the Aurora Student Design Contest team is back at work to publish the Proceedings, collect suggestions and have them integrated into the guidelines for the next Student Contest.

The extremely positive experience and response from students, professors and professionals alike has provided the thrust to start organising a second Aurora Student Contest.