Fly me to the Moon

By Wendy McCorry, Science Communicator

September 2006 saw the first ever European Moon landing. Now, before you rush off to the doctor to enquire as to how you managed to neither see nor hear reports of such an event, let me explain further. Alright, so it didn't exactly involve man stepping onto the Moon, and okay, it was more of a 'crash-landing', but it was a momentous occasion nonetheless. As explained in previous Astronotes, the landing in question was of SMART-1, an unmanned European Space Agency Satellite, which has spent almost 2 years orbiting the Moon. It was deliberately crashed onto the lunar surface on September 3rd to end its mission.

SMART -1 (SMART stands for "Small Missions for Advanced Research in Technology") was launched on 27th September 2003, from the European Spaceport in Kourou, French Guiana. It began orbiting the Moon fourteen months later, in November 2004.

"SMART hurtled into the Lake of Excellence"

The main part of the satellite's job was to test new spacecraft technologies, such as Solar Electric Primary Propulsion, which uses solar-powered thrusters to propel the craft. It also experimented with the use of miniaturized scientific instruments, which are thought to produce enhanced efficiency.

SMART-1's secondary objective was to gather more information about the Moon, thus providing clues as to how it was created. Using X-ray and Infrared imaging, SMART-1 took pictures of the lunar surface from several different angles. This has allowed scientists to create updated 3D images of the Moon's morphology, including the Peaks of Eternal Light (PELs) - mountaintops permanently bathed in sunlight, surrounded by deep valleys in permanent darkness. X-ray spectroscopy was also used to investigate the Moon's chemical composition, leading to an announcement by ESA in 2005 that calcium was detected on the Moon.

Image Credit: ESA

SMART-1 took a one-way trip to the moon A tiny part of the Moon will be forever Europe.

Having completed an 18 month-long thorough investigation of the Moon (initially planned to last only 6 months), and yielding a huge wealth of data, SMART-1 was finally brought down at 05.42 on 3rd September 2006. Moving at approximately 4473 mph, the satellite hurtled onto the lunar surface in the Lake of Excellence region, close to the line which separates day and night. This simulated a meteor impact visible through telescopes on Earth, and also exposed surface materials with the potential for analysis. Unfortunately for us, the Moon was not visible in Europe at the time of impact, but it could be seen in North and South America.

ESA have hailed the project as an enormous scientific and technological success, leading the way for future missions to the moon and beyond. So as poor SMART-1 lies shattered upon the surface of our own satellite, perhaps the tiny craft only 1m across can take heart from the words of Professor Southwood, ESA's Director of Science, "It seems that right now everyone in the world is planning on going to the Moon. Future scientific missions will greatly benefit from the technological and operational experience gained thanks to this small spacecraft."