

China Heads for the Moon

By Wendy McCorry, Science Communicator

This month we will be celebrating Chinese New Year, as February 2008 marks the beginning of the Year of the Rat. This will be a significant year for the Chinese space programme, as it sees the continuation of China's ambitious Lunar Exploration Programme (CLEP), which successfully got under way at the end of last year.

Chang'e 1 (the word Chang'e means goddess of the Moon), an unmanned lunar orbiter, was launched from Xichang Satellite Launch Centre in Sichuan Province on 24 October 2007, having been delayed from the previous April. The satellite went into lunar orbit on 5 November, whereupon it transmitted thirty traditional Chinese songs and pieces of music, and three weeks later sent back its first image of the surface of the Moon.

“...the aim will be to return samples of lunar rocks to Earth...”

This mission is due to be the first or 'orbiting' stage in a multi-stage project, and is scheduled to last for one year. During this time Chang'e 1 will use twenty-four pieces of lunar probe equipment to attempt to meet the following four main objectives:

To produce 3D images of the entire lunar surface, including areas near to the poles, which have not previously been covered by lunar missions.

These images may then be used as a reference to find suitable sites for future lunar landings;

To map the distribution of various elements on the Moon's surface, in particular those elements which may prove to be useful or valuable resources;

To evaluate the depth of the lunar soil, and to assess its levels of Helium-3, a possible nuclear fusion power source which is rare on Earth;

To probe the physical environment between the Earth and the Moon, obtaining data on the Solar



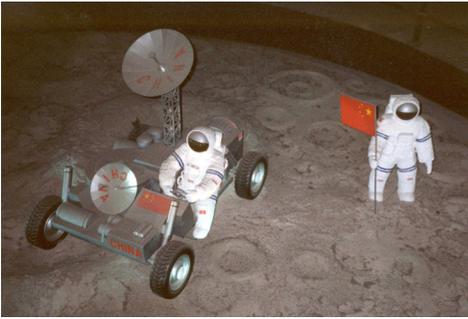
The Next Men on the Moon? Candidates for Taikonaut training. Spaceflight seems to be a men-only affair in China

Wind and assessing the impact of solar activity on both the Earth and the Moon.

ESA are collaborating with the CNSA (China National Space Administration) on this mission, by supplying spacecraft and ground operations support services. The two agencies plan to share data from both Chang'e 1 and ESA's SMART-1 lunar mission, and also to set up a visitor's programme to advance future developments in lunar research.

Phase two of the Chinese programme is intended to be the 'landing' phase. At least two landers may be launched this year or next, carrying small remote-controlled rovers which will carry out an exploration of a limited area of the Moon's surface. This will be followed by the launch of the Chang'e 2 spacecraft in 2012, which will deploy a six-wheeled lunar vehicle, similar to NASA's Spirit and Opportunity Mars rovers, but using a nuclear power source instead of rechargeable lithium ion batteries. The Moon's 28 day cycle of day and night means solar power cannot be used to charge the rover's batteries.

Based on the 'landing' phase, the third stage of China's lunar programme is intended to be the



A model Moon landing The Chinese government signalled its intentions with this diorama displayed at the Hanover Expo in 2000. Illustration from the superb www.astronautix.com website.

'returning' phase. Planned for 2017, the aim of this phase of the programme will be to return

samples of lunar rocks to Earth for analysis. It is expected that at this time China's manned lunar missions will also commence, beginning with a circumlunar mission in a Shenzhou spacecraft. This is the same spacecraft which, in 2003, carried China's first taikonaut, Yáng Liwi, into space. In the same period the United States hopes to return astronauts to the Moon through NASA's Constellation program. Could this be the start of a new Space Race?