INTERNATIONAL ASTRONAUTICAL FEDERATION

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IAC 2013, LATE-BREAKING NEWS SESSION

The Late Breaking News session at the 64th International Astronautical Congress (IAC) in Beijing on Friday (27 September 2013), covered both the latest developments in China's human spaceflight programme and the NASA LADEE mission to the Moon.

Mrs Ping Wu, Deputy Director of the China Manned Space Agency (CSA), said that through Tiangong-1, Shenzhou 8, 9 and 10 missions, China has made significant technology breakthroughs and mastered key space rendezvous and docking technology objectives.

She also presented further details in the planned Chinese space station, which she confirmed was expected to be completed in 2022.

"China will strengthen international exchange and cooperation in the development, operation and application of the space station, promote the development of the world space technology, and make contributions to the peaceful utilisation of outer space and the benefit of mankind," she stated.

During construction of the space station, the astronauts will visit it intermittently and their mission duration will depend on flight requirements - they will conduct some EVAs to assist with space station construction and maintenance.

Once complete, a crewed spacecraft is scheduled to visit the space station twice a year, and a cargo craft will provide re-supplies once or twice a year.

During the operational phase, the space station will be used for long-term man-tended work, with a nominal status of three crewmembers who would rotate every six months.

When the space station is completed it will comprise a core module and two experiment modules, supported by the crew carrying and cargo spacecraft, the latter being expendable.

The core module will be used to control and manage the space station, also providing support and free activity space for the crew.

The two experiment modules will be used for space science and applications experiments. They will be docked to the forward axial port of the node module and then transferred to the side port by a robotic arm.

Chinese astronaut Haicheng Nie, who has flown two missions - Shenzhou 6 in 2005 and the Tianginong 1/Shenzhou 10 in June 2013, spoke about the different phases of the Shenzhou 10 mission and outlined its key objectives:

- To launch the Shenzhou spacecraft, providing crew and cargo transportation services for the Tiangong-1 target vehicle, and further demonstrating the function and performance of the space rendezvous and docking system, and the manned transportation system.

- To further demonstrate the capacity of the complex to support the crew's life, work and health, as well as the crew capability to carry out the flight.

- To research the crew adaptability to the space environment and their space operational efficiency, and conduct in-orbit maintenance tests and outreach activities.

He said the flight had carried over 30 space medicine experiments and reported that the crew had adapted well to weightless environment, the longest duration orbital flight to date for China's manned programme.

NASA on way to Moon

Speaking in the second Late Breaking News session of the day, NASA's Ramon de Paula gave details about NASA's latest space mission - the Lunar Atmosphere and Dust Environment Explorer (LADEE).

The spacecraft is a robotic mission that will orbit the Moon to gather detailed information about the lunar atmosphere, conditions near the surface and environmental influences on lunar dust.

Dr de Paula said a thorough understanding of such characteristics will address some long-standing "unknowns", and help scientists understand other planetary bodies as well.

LADEE was launched on a Minotaur V rocket from the Wallops Island Mid-Atlantic Regional Spaceport on 6 September 2013. During its nominal 100-day scientific mission, LADEE will orbit around the Moon's equator and use instruments aboard the spacecraft to study the lunar exosphere and dust.

Its instruments include a dust detector, a neutral mass spectrometer and an ultraviolet-visible spectrometer. It also carries a technology demonstration payload consisting of a laser communications terminal.

“If we can understand what is happening on Moon, we can understand more of what is happening on Earth,” he told delegates.

Dr de Paula said information gathered by the lunar mission could also be extrapolated to asteroids and this knowledge would be very useful when planning human missions to asteroids.

“The closest body to Earth that has an exosphere that would have similarities with an asteroid is the Moon - and it still remains a mystery,” he explained.

"It is very important science to understand this type of exosphere - and it will also help with understanding the planets Mercury and Venus.”

Dr de Paula added that understanding better what happens to lunar dust, which is “highly charged and seems to get in all sorts of equipment”, is also important for future Moon exploration expeditions.

“Why is dust so sticky and fine, and what effect does it have on equipment are important questions to answer if we want to put new missions on the lunar surface,” he said.

In addition its science instruments, LADEE is also carrying a laser communications payload to test technology that will become increasingly important on future missions.

The optical communication system - known as the Lunar Laser Communication Demonstration (LLCD) - will use a laser to transmit and receive data as pulses of light.

This method of communication has the potential to provide five times the data return of radio frequency communication and the technology on LADEE is a direct predecessor to NASA's Laser Communication Data Relay (LCDR) satellite due to launch in 2017.

Contact: media@iafastro.org