

# China Plans 'New World' Program To the Moon

by Marsha Freeman and William Jones

China's National Aerospace Administration director Luan Enjie, in an interview with the *People's Daily* on March 3, outlined his nation's comprehensive plans for exploring the Moon. Two days before, he had stated that after the Shenzhou missions, in which China is expected to launch its first astronaut into Earth orbit this Fall, China will focus on studying the Moon.

The lunar effort is being planned as a multi-phase program, dubbed the "Chang'e Program," in reference to a traditional Chinese legend in which a young fairy flies to the Moon with her pet rabbit. The program is awaiting government approval, and experts state that the first unmanned mission in the series could be readied in two and a half years.

According to China's chief lunar exploration scientist, Ouyang Ziyuan, that first mission would be a satellite to orbit the Moon, mapping its surface in high resolution and producing three-dimensional images. It would study the elemental composition of the surface and enhance the understanding of the lunar environment, which is important for planning future missions. Luan has reported that the first small lunar orbiter will be called Moon Rabbit, in honor of Chang'e.

Following the orbiter, phase two would consist of lunar landings and remote-controlled surface rovers. A later spacecraft would land and return samples of lunar soil to Earth, which would make China the third nation to do so, after the United States and Russia.

## A Vital Task for Humanity

The Chinese have stressed that they do not see their lunar program as a "space spectacular." Ouyang said that the proposed timeline is critical, because "Earth's nearest neighbor probably holds the key to humanity's future subsistence and development."

Speaking at an aerospace conference in early March, space program head Luan said that the initial phase of the Chang'e program could be completed by 2010. He said that to minimize costs and development time, the program would largely use existing technology. The "tried and tested" Long March 3A rocket would be the launch vehicle, and the lunar orbiter would be based upon the well-demonstrated DongFengHong 3 communications satellite design.

Luan told *Peoples' Daily* on March 3 that the Chinese Academy of Sciences would receive, handle, and interpret the lunar data, such as the elemental content of the surface,

its thickness, and other features. "The Moon has become the focal point wherein future aerospace powers contend for strategic resources," Luan said. "The Moon contains various special resources for humanity to develop and use." He named Helium-3, as unique to the lunar soil. "It is a clean, efficient, safe, and cheap new type of nuclear fusion fuel for mankind's future long-term use, and it will help change the energy-resource structure of human society." As Xinhua News Agency noted, "On the Moon there are between 300,000 and 500,000 tons of Helium-3 reserves, capable of sustaining the Earth's electricity [production] for 7,000 years."

Luan said that in the longer term, building permanent bases on the Moon "is a vitally important first step in human development of outer space resources, and the expansion of habitable space."

"The exploration of the Moon can become the incubator of science and technology, and promote the development of the nation's economy by bringing forth new ideas of a revolutionary nature," Luan said. Mankind must learn to "leave the Earth homeland, establish permanent research stations, develop products and industries in space, and set up a self-sufficient extraterrestrial homeland."

Using lunar minerals and energy resources are "the most important driving force for a return to the Moon," he said. "The Moon possesses many distinctive types of natural resources for man's development and use. On the Moon there are numerous minerals and energy resources, which could provide significant replenishment and reserves to those of the Earth, which in the future could have a profound impact on mankind's sustainable development." "The Moon," according to Xinhua News Agency, "is in the process of becoming China's 'New World' of scientific research."

The comprehensive long-range space development program that the Chinese government has been following lists lunar exploration—first unmanned, and then manned—as a central goal of its space efforts.

The principal scientist of China's lunar program, Ouyang Ziyuan, stated in December 2002 that "China is expected to complete its first exploration of the Moon in 2010." Following that, it "will establish a base on the Moon." China hosted an International Symposium on Deep Space Exploration Technology and Application in December, which included a presentation on Chinese "Micro Lunar Probe Technology." On Dec. 6, Ouyang told the press that China also sees the necessity for international cooperation in lunar exploration.

This Spring, the European Space Agency will launch its Small Missions for Advanced Research in Technology, or SMART-1 spacecraft, to search for water ice on the surface of the Moon.

Japan is planning to launch its Lunar-A mission a few months later. And Japan's follow-on Selene, or Selenological and Engineering Explorer, will release two smaller sub-satellites into lunar orbit. At the present time, the United States has no firm plans to return to the Moon.