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Over the moon India set for Mars mission

Max Martin

Bangalore, January 28, 2010

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Water on moon has the Indian space scientists dreaming of colonies, which were until now found only in Arthur C. Clarke's science fiction novels. The Indian Space Research Organisation (ISRO) is looking at the possibility of setting up a base on the moon. It is also planning further forays into space, beginning with Mars.

"There are three possible time slots to send a Mars mission - in 2013, 2016 and 2018," space agency chief K. Radhakrishnan said in Bangalore on Wednesday. "We will be looking at 2016 or 2018."

He said ISRO's launch vehicles - Polar Satellite Launch Vehicle (PSLV) and Geosynchronous Satellite Launch Vehicle (GSLV) - could be used to send a satellite near Mars. "It can be done in four or five years, but the challenge is to define what scientific experiments we would conduct there," Radhakrishnan said.

The latest addition to such a concept came with the term Chandravihar (lunar neighbourhood) mentioned in a pop science book, *Mission Moon*. The book by S.K. Das, an honorary adviser to the ISRO, was released in Bangalore on Wednesday. Radhakrishnan told schoolchildren gathered at the ISRO for the book launch to imagine Chandravihar and work towards it. "The moon is very much a livable place. Many of you will be there. Many will be part of its building effort," he said.

Chandravihar is envisaged as a base for space exploration, buzzing with engineers, geologists, astronomers and biologists.

Former ISRO chairman Madhavan Nair said Chandrayaan's finding of possibly large quantities of water near the lunar poles had increased the chances of building the lunar base. "It is going to be the frontier for exploration of the universe," he said. Nair's enthusiasm stems from the findings of the moon minerology mapper (M3) on board Chandrayaan-1 that covered about 97 per cent of the lunar surface.

A detailed analysis of the data obtained last year clearly indicated water molecules on the moon, Nair said. His logic was if there was water near the

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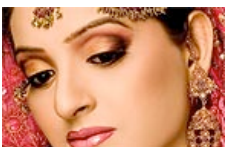
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molecules on the moon, Nair said. His logic was if there was water near the cold poles and sunlight on the rims of lunar craters, people could live there.

Hydroxyl - a molecule comprising an oxygen atom and a hydrogen atom - was also found in the lunar soil. The M3 findings have been confirmed by fresh analysis of data from NASA's deep impact mission launched in 2005 and lab test of samples brought from Apollo missions. Results from the analysis of data from another NASA mission, Cassini - that flew by the moon on its way to Saturn in 1999 - have also confirmed the finding.

Former Isro chairman Prof U.R. Rao said moon was a rich source of Helium-3, a fuel of nuclear fusion, and could one day serve all the energy needs of earth for thousands of years. But he wasn't too sure if a colony on moon was a good idea. Rao, however, admitted that the Japanese mission Kaguya's recent forays into moon's underground tunnels offered better hopes for human habitation.

Recently, the Japanese Aerospace Exploration Agency found a skylight-like deep hole on the moon that could open into a huge subsurface tunnel. The discovery suggested there were many channels carved out by lava flow. "They could shield human beings from space radiation and other hazards," Rao said.

NASA's lunar reconnaissance orbiter (LRO) is expected to take sharper images and reveal more such skylights. LRO is the first mission of NASA's vision for space exploration, a plan to return to the moon and then travel to Mars and beyond. The ISRO seemed to share a similar vision as Chandrayaan-2, slated for 2013, involves moon landing and sending a rover on the lunar surface. The ISRO is also mulling a manned lunar mission.

Radhakrishnan said scientists all over the world were talking about human missions to Mars and colonies by 2030, suggesting India won't be far behind. "India's first human space programme, which will have two astronauts in spacecraft orbiting the Earth, should be achieved in about six years," he said.

There has been a lot of activity around Mars of late. NASA's Mars missions include the Orbiter, 2001 Mars Odyssey, two robots named Spirit and Opportunity that landed on opposite sides of the red planet in 2004, the Mars Reconnaissance Orbiter with a powerful camera, and the Mars Science Laboratory slated for next year.



ON THE STANDS February 8, 2010



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