



Lunar CRater Observation and Sensing Satellite

Interview with Brian Day

By Chase Bains, AAE 12th grade

When I received these detailed answers from Mr. Brian Day, it was amazing to see how much he knew about the LCROSS Mission from every possible aspect. I definitely feel much more prepared now to attend the launch in mid-June. It was also quite interesting to learn about how Mr. Day had an evident passion for astronomy from an extremely young age. It is very clear that Brian Day enjoys his job as a NASA astronomer. When I attend the LCROSS Launch next month, I will certainly bring these answers with me and I look forward to learning more from Mr. Day there.

Answers provided by Brian Day, LCROSS Education and Public Outreach Lead

- 1. Why is finding water so important?** Finding water is important for a number of reasons. It could be a very important resource for future astronauts on the Moon. Water has uses beyond just drinking. It can be broken apart to make oxygen for breathing and hydrogen for fuel. There is also great scientific interest in finding water on the Moon. If we do find water there, it could tell us quite a bit about how water might have made it from the outer solar system into the inner solar system and where the Earth's supply of water may have come from.
- 2. Can you explain the function of the Lunar Reconnaissance Orbiter (LRO)?** LRO has multiple goals. It will photographically map the Moon in unprecedented detail. It will use a laser altimeter to measure the topography of the lunar surface. It will peer inside permanently-shadowed craters using an instrument sensitive to ultraviolet starlight. It will map surface and subsurface temperatures. It will use a neutron detector to find and study areas where hydrogen is concentrated. It will measure the radiation near the Moon to determine its potential biological effects. Finally, it will demonstrate synthetic-aperture radar and communication technologies.
- 3. How long have you been interested in astronomy?** My parents told me that I used to enthusiastically point at the Moon and the stars even before I could talk, so I guess it's been a long time. I got my first telescope when I was in the 5th grade and have been looking through them ever since.
- 4. What caused the delays in the launch of the LCROSS Mission?** Schedules at launch pads can be pretty tight. LCROSS traded launch opportunities with another mission, moving us from late 2008, to early 2009. Delays in missions preceding us on the launch pad have pushed us back to a June, 2009 launch.
- 5. What has been your best scientific memory so far in your professional career?** Watching my first Space Shuttle launch made a very big impression. That was the launch of STS-110 on April 8, 2002. However, I am certain that the memories that will come out of the LCROSS mission will surpass that very easily.



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6. Could the LCROSS Mission serve as a stepping stone for other missions?

Yes it could. If water ice is actually found on the Moon, many researchers would be very interested in getting samples of that ice and studying it. In addition, the technologies used in LCROSS, such as building a spacecraft around the launch vehicle payload adapter ring, could be very useful in the design of future missions.

7. How likely is it that NASA will be able to establish a permanent American base on the Moon?

Just what plans NASA develops for future lunar exploration will depend, in part, on what we discover about the Moon through robotic missions such as LCROSS and LRO. NASA is working with 13 of the world's space agencies and with the space community to develop and refine objectives and potential achievements that would be possible from lunar exploration.

8. What would the discovery of hydrogen in the form of water on the Moon mean for astronomy in general?

It will tell us something important about the environment in which we live. Remember, our environment does not end with the atmosphere. The environment of the inner solar system, particularly within the region of our solar system known as the "habitable zone", can have profound effects on us here on Earth. Finding water ice deposits on the Moon would help us better understand the likelihood of water ice accumulating within the habitable zone in our solar system, and allow us to make better-informed predictions about how it might accumulate with the habitable zones in other solar systems.

9. What is the role of the Shepherding Spacecraft in the mission?

The Shepherding Spacecraft initially guides and aims the Centaur upper stage of our rocket toward its target on the Moon. After releasing the Centaur upper stage, it will observe the Centaur impact and fly into the plume of debris that the impact creates. The instruments on the Shepherding Spacecraft will allow us to analyze the debris so that we can determine if there is any water, and if so, how much. Finally, the Shepherding Spacecraft will impact the Moon's surface four minutes after the Centaur and create a second plume that can be studied from telescopes here on Earth, in orbit around the Earth, and from instruments on spacecraft in lunar orbit.

