

LRO's Eyes, Nose, and Other Tools

LRO has a **body** that holds the instruments (engineers call this a platform). The body needs **solar panels** for collecting energy from the Sun, a **battery** to store the energy, **communications equipment** to send information back to eager scientists on Earth, and a **propulsion system** to help the spacecraft move a bit in its orbit (vroom-vroom!). It also has tools for exploration:

Eyes

Cameras (*Lunar Reconnaissance Orbiter Camera* or LROC) will collect very detailed pictures.

"Flashlights"

A harmless laser (*Lunar Orbiter Laser Altimeter* or LOLA) and radar (*Miniature Radio Frequency* or Mini-RF) will send beams to the Moon's surface. The beams will bounce back and help scientists figure out how far away the surface is, how smooth or rough it is — and if ice is there — because different surfaces cause beams to scatter in different ways.

Night-Vision Goggles (*Lyman Alpha Mapping Project* or LAMP) are able to "see" ultraviolet light that is reflected off the Moon's surface from starlight. Using this tiny bit of light, scientists can look into places where regular cameras can't "see" — places like very deep craters that are always in the shadows. These places are protected from the Sun's heat and radiation — which means they are *very cold* — and they may have hidden ice!

Hydrogen "Sniffer" or neutron detector (*Lunar Exploration Neutron Detector* or LEND) finds the element hydrogen. Water is two parts hydrogen and one part oxygen (H₂O). If scientists find hydrogen, they probably will have found water ice. All people need water to drink. Water also can be broken down into hydrogen and oxygen and used for fuel.

Thermometer (*Diviner Lunar Radiometer Experiment* or Diviner) measures and maps the temperatures during the day and night at different places on the Moon's surface. This will help scientists figure out where ice might be!

Radiation Detector (*Cosmic Ray Telescope for the Effects of Radiation* or *CRaTER*) measures how much and what types of the Sun's radiation are shining on the Moon's surface. Radiation can be very harmful to people; we have to know the amount of radiation in different places on the Moon so that we can live and work there safely and for a long time.