**What sets the Mars Curiosity Rover different than other rovers?**

The Mars Science Lab was launched November 26, 2011, and is scheduled to land on Mars at Gale Crater on August 6, 2012. The rover Curiosity, after completing a more precise landing than ever attempted previously, is intended to help assess Mars' habitability for future human missions. Its primary mission objective is to determine whether Mars is or has ever been an environment able to support life.

Curiosity is five times as large as either of the Mars Exploration Rovers Spirit or Opportunity and carries more than ten times the mass of scientific instruments present on the older vehicles. The rover is expected to operate for at least 686 days as it explores with greater range than any previous Mars rover. Here are some of the specs that help set Curiosity apart from the other rovers:

The rover Curiosity is 3 meters in length, and weighs 900 kg, including 80 kg worth of scientific instruments. It is approximately the size of a Mini Cooper automobile.

Once on the surface, Curiosity will be able to roll over obstacles approaching 75 cm high. Maximum terrain-traverse speed is estimated to be 90 meters per hour by automatic navigation, however, with average speeds likely to be about 30 meter per hour depending on power levels, difficulty of the terrain, slippage, and visibility. It is expected to traverse a minimum of 12 miles in its two-year mission.

Curiosity is powered by a radioisotope thermoelectric generator, as used by the successful Mars landers Viking 1 and Viking 2 in 1976. Radioisotope power systems are generators that produce electricity from the natural decay of plutonium-238, which is a non-fissile isotope of plutonium. Heat given off by the natural decay of this isotope is converted into electricity, providing constant power during all seasons and through the day and night, and waste heat can be used via pipes to warm systems, freeing electrical power for the operation of the vehicle and instruments.

The temperatures that Curiosity can encounter vary from +30 to −127 °C. Therefore, the Heat rejection system uses fluid pumped through 60 meters of tubing in the MSL body so that sensitive components are kept at optimal temperatures.

The two identical on-board computers contain radiation-hardened memory to tolerate the extreme radiation environment from space and to safeguard against power-off cycles. Curiosity has two means of communication -- an X-band transmitter and receiver that can communicate directly with Earth, and a UHF software-defined radio for communicating with Mars orbiters. Communication with orbiters is expected to be the main method for returning data to Earth, since the orbiters have both more power and larger antennas than the lander. At landing time, 13 minutes, 46 seconds will be required for signals to travel between Earth and Mars.

Like previous rovers Mars Exploration Rovers and Mars Pathfinder, Curiosity is equipped with 6 wheels in a rocker-bogie suspension. The suspension system will also serve as landing gear for the vehicle. Its smaller predecessors used airbag-like systems. Curiosity's wheels are significantly larger than those used on the previous rovers. Each wheel has a pattern of grooves that help it maintain traction, while leaving a distinctive track in Martian soil. That pattern, to be photographed by on-board cameras, will be used to judge the distance travelled.