Precisely on time and target, NASA's Curiosity rover touched down safely on Mars Monday to begin an ambitious two-year trek through the red planet. Richard Rainen, Curiosity Rover mechanical team manager, joins The News Hub with details. Photo: AP.

By ROBERT LEE HOTZ

PASADENA, Calif.—NASA’s Curiosity rover began transmitting photos to Earth even before the red dust from its flawless landing on Mars had cleared Monday, a warm-up for its two-year trek across a rugged crater that could reveal whether the planet ever was hospitable to life.

Cheers erupted here in the control room of Jet Propulsion Laboratory, which is managing the $2.5 billion mission. Elated that the rover’s daring and never-tested landing technique had worked, ebullient engineers and scientists pumped their fists in the air and whooped. Several wept.

Still, the celebrating couldn’t mask the new reality of the National Aeronautics and Space Administration, which has been forced to scale back its once-vast ambitions in the face of slimmer budgets and questions about its relevance.

Next year, NASA plans to launch a probe to study the upper atmosphere of Mars, but planners this month are debating what future Mars landings—if any—the space agency can afford. Earlier this year, NASA pulled out of an ambitious, joint U.S.-European effort to land a next-generation rover on Mars and eventually return some samples to Earth.

While Curiosity’s landing is bound to burnish NASA’s image and improve its employee morale, the mission may provide only a temporary political boost for an agency that has struggled to chart a new course amid spending constraints, persistent legislative fights and last year’s retirement of the space shuttle fleet.

NASA chief Charles Bolden has said that NASA is determined to pursue less-expensive unmanned exploration plans for Mars and the rest of the solar system. He also has said that international cooperation is essential to any hope of ultimately putting astronauts on the surface of the red planet.

Despite the uncertainties, Monday was a day to savor for the hundreds of mission engineers and scientists at Jet Propulsion Laboratory.

Flying on automatic pilot, the one-ton Curiosity—the largest and most complex mobile laboratory ever landed on another planet—touched down perfectly at about 1:32 a.m. Eastern time Monday. Its first grainy, wide-angle images showed its own left rear wheel parked on the surface of Gale Crater near the...
Precisely on time and target, NASA's Curiosity rover touched down safely on Mars Monday to begin an ambitious two-year trek through the mountainous red planet. WSJ's Michael Kofsky explains why NASA expects a scientific goldmine.

Curiosity is twice as long, five times as heavy and vastly better equipped than two previous NASA Mars rovers that landed in 2004. A rover named Opportunity has been driving along the rim of a crater called Endeavor. Mired in sand, the Spirit rover, meantime, stopped sending communications in March 2010. But both discovered suggestive evidence that water might have once flowed on the surface of the planet.

The initial images transmitted Monday by Curiosity were taken through the vehicle's hazard-avoidance cameras, before their transparent but dusty lens covers had been removed. But mission controllers soon expect to be taking sharp, full-color images in 3-D, panoramas and high-definition videos of Gale Crater.

The Mars landing was a high-profile gamble by NASA on a novel landing procedure. Too big to rely on air bags to cushion its fall as with previous Mars landers, Curiosity landed through an automated system of high-speed maneuvers, a supersonic parachute, eight retro-rockets and a set of "sky-crane" tethers that lowered the vehicle gently the last few feet to the ground.

"This is an amazing achievement," said Mr. Bolden, the NASA administrator.

Steady electronic "heartbeat" tones relayed from Curiosity across space to Earth indicated a successful landing to the control room at Jet Propulsion Laboratory.

"That rocked," said deputy project manager Richard Cook, his face flushed with emotion.

"If anybody has been harboring doubts about the status of U.S. leadership in space, well, there's a one-ton, automobile-size piece
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Metropolis: 'Curious' Crowds Pack Times Square for Mars Landing

of American ingenuity, and it's sitting on the surface of Mars right now," said White House science adviser John P. Holdren at a news conference after the landing.

Mr. Holdren called the landing "an unprecedented technological tour de force."

After its 352-million-mile voyage from Earth, the Curiosity craft touched down in Gale Crater—about a mile from the center of the targeted landing zone—late in the afternoon by Martian time, plunging through pink skies sprinkled with high-altitude ice clouds. A dust storm earlier had threatened to buffet the craft off course during its descent but by landing time it had dissipated.

"It was a beautiful clear day when we landed," said mission scientist John Grotzinger.

The descent was so smooth, and required so few corrective bursts of its eight, hydrazine-fueled retro rockets, that the rover touched down with almost one-third of its fuel still in reserve, JPL flight controllers said.

Based on their preliminary analysis, mission managers believe Curiosity survived the landing unscathed, coming to rest on a relatively flat part of the crater floor. It will be a while, however, before mission operations engineers have tested all of the rover’s electronics and mechanical systems for possible damage during the descent and are ready to begin steering the vehicle around the crater and the nearby mountain, known as Mount Sharp.

"We have weeks, if not months, of check-out, before we are completely confident," said Mr. Watkins.

In the next few days, JPL’s mission operations team expects to deploy Curiosity’s antenna for high-speed transmissions to NASA’s Deep Space Network on Earth, and its "Mastcam" flexible photo arm, which has side-by-side cameras for stereoscopic, or three-dimension, imaging, as well as cameras for wide-angle panoramas and video.

The rover may venture on its first test drive in early September, mission managers said. By October, it could be ready to analyze its first scoop of Martian soil. In November, it likely will start to drill into the surface and extract mineral samples.

"We want to make sure we are running on all cylinders before blazing across the plain there," said Mr. Grotzinger. "The mission is about patience."

—Andy Pasztor contributed to this article.

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