

# Cheering a Mars landing

Unmanned craft safely settles on the red planet

The Associated Press

CAPE CANAVERAL, Fla. — A NASA spacecraft designed to burrow beneath the surface of Mars landed on the red planet Monday after a six-month, 300-million-mile journey and a perilous, 6-minute descent through the rose-hued atmosphere.

Flight controllers at NASA's Jet Propulsion Laboratory in Pasadena, California, leapt out of their seats and erupted in screams, applause and laughter as the news came in.

"Touchdown confirmed!" a flight controller announced.

The three-legged InSight spacecraft reached the surface after being slowed by a parachute and braking engines, the space agency said. Updates were coming in via radio signals that take more than eight minutes to cross the nearly 100 million miles between Mars and Earth.

It was NASA's ninth attempt to land on Mars since the 1976 Viking probes. All but one of the previous U.S. touchdowns were successful.

NASA last landed on Mars in 2012 with the Curiosity rover.

Viewings were held coast to coast at museums, planetariums and libraries, as well as Times Square.

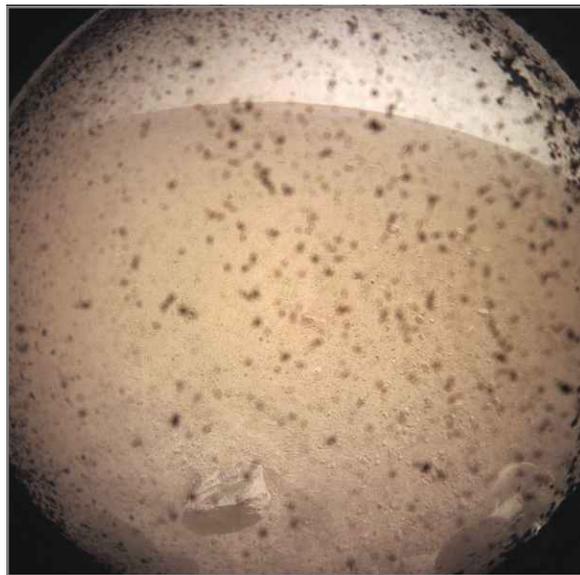
The plan called for the spacecraft to go from 12,300 mph to zero in six minutes flat as it pierced the Martian atmosphere and settled on the surface.

"Landing on Mars is one of the hardest single jobs that people have to do in planetary exploration," said InSight's lead scientist, Bruce Banerdt. "It's such a difficult thing, it's such a dangerous thing that there's always a fairly uncomfortably large chance that something could go wrong."

Mars has been the graveyard for a multitude of space missions. Up to now, the success rate on the red planet has been only 40 percent, counting every attempted flyby, orbital flight and landing by the United States, Russia and other



Engineers at NASA's Jet Propulsion Laboratory in Pasadena, California, erupt in screams at news of the successful landing.



The first image NASA's InSight lander returned Monday from the surface of Mars.

countries since 1960.

The United States, however, has pulled off seven successful Mars landings in the past four decades, not counting InSight, with only one failed touchdown. No other country has managed to set and operate a spacecraft on the dusty red surface.

InSight was shooting for Elysium Planitia, a plain near the Martian equator that the In-

Sight team hopes is as flat as a parking lot in Kansas with few, if any, rocks.

This is no rock-collecting expedition. Instead, the stationary 800-pound lander will use its 6-foot robotic arm to place a mechanical mole and seismometer on the ground. The self-hammering mole will burrow 16 feet down to measure the planet's internal heat, while the seismometer listens

for possible quakes.

Nothing like this had been attempted before at our next-door neighbor, nearly 100 million miles away. No lander has dug deeper than several inches, and no seismometer has ever worked on Mars.

By examining the interior of Mars, scientists hope to understand how our solar system's rocky planets formed 4.5 billion years ago and why they turned

## Heightened interest on LI

Workers at Frequency Electronics Inc., whose communications gear is in orbit around Mars, heaved "sighs of relief" when the InSight robotic lander touched down on the Red Planet Monday.

"We were watching it every second," president and chief executive Stanton Sloane said of the company's roughly 150 employees at its Uniondale headquarters.

Sloane said the company's oscillators are in a satellite circling Mars and are available to provide relay communications to InSight.

He said it was unclear if NASA officials were communicating with InSight via a direct link or through the Mars Reconnaissance Orbiter, which reached Mars orbit in 2006.

Plainview-based Aeroflex Holding Corp. provided motors that drove the wheels, antenna and robotic arm joints of NASA's rover Curiosity, which landed on Mars in November 2011. Aeroflex was acquired by British aerospace company Cobham PLC for \$1.46 billion in 2014.

In 2015, Cobham's Aeroflex unit was selected to provide motors to propel wheels and move other parts on a Mars rover in 2020, the company said in a release.

The timing and frequency measurement devices of Frequency Electronics are used for communications and navigation. Its equipment also has been used in the Hubble Space Telescope and the Voyager Spacecraft. — KEN SCHACHTER

out so different — Mars cold and dry, Venus and Mercury burning hot, and Earth hospitable to life.

InSight has no life-detecting capability, however. That will be left to future rovers. NASA's Mars 2020 mission, for instance, will collect rocks that will eventually be brought back to Earth and analyzed for evidence of ancient life.