

At 9:32 a.m July 16 1969, [Apollo 11 astronauts Neil Armstrong, Buzz Aldrin and Michael Collins](#) The three-stage 363-foot rocket will use its 7.5 million pounds of fuel to propel them into space and into history. (picture?)

1609 Galileo Galilei (1564 - 1642) observes Mars with a primitive telescope, becoming the first person to use it for astronomical purposes.

1659 The Dutch astronomer Christiaan Huygens (1629 - 1695) draws Mars using an advanced telescope of his own design.

1698 Huygens publishes *Cosmotheoros*, which discusses what is required of a planet to support life, and speculates about intelligent extraterrestrials. This is one of the first published expositions of extraterrestrial life.

1877 Schiaparelli uses the term "canali" to describe the streaks on the surface of Mars. This is wrongly thought to mean "canals," and is thought to imply that Mars has intelligent life that has built a system of canals.

1960-1964

4 USSR failures

(2) Didn't reach Earth orbit

(2) Earth orbit only; spacecraft broke apart

(1) Radio Failed

1964 Us failure

1964 Mariner 4 (US) arrived to Mars and sent 21 images (pictures?).

These represented the first images of another planet ever returned from deep space.

Russia

Japan 1998

ESA European Space Agency 2003

Orbiter imaging Mars in detail and lander lost on arrival

2013 India success

NASA has outperformed other space agencies by a wide margin, completing 13 successful missions (against five failures) since 1964. The Russians have had particularly bad luck, with 15 failed missions and only four partial successes.

*Curiosity* was launched November 2011, landed August 6, 2012 (pictures?).

Camera high-resolution color and video

hand lens imager color pictures of features as tiny as 12.5 microns — smaller than the width of a human hair, on the end of Curiosity's five-jointed, (2.1-meter) robotic arm, which is itself a marvel of engineering.

Sample analysis at mars: three separate instruments — a mass spectrometer, a gas chromatograph and a laser spectrometer. These instruments will search for carbon-containing compounds, the building blocks of [life as we know it](#). They will also look for other elements associated with life on Earth, such as hydrogen, oxygen and nitrogen.

CheMin will identify different types of minerals on Mars and quantify their abundance, which will

help scientists better understand past [environmental conditions on the Red Planet](#).

Like SAM, CheMin has an inlet on Curiosity's exterior to accept samples delivered by the rover's robotic arm. The instrument will shine a fine X-ray beam through the sample, identifying minerals' crystalline structures based on how the X-rays diffract.

Comments:

Nowadays -- at least for some space travel fans -- Martian robots aren't so cool anymore.

"It's not such a great picture anymore," a smiling Mike Watkins told reporters.

Curiosity "is just another box with wheels on Mars," [says CNN commenter](#)  
[It could always be worse](#).

"Develop useful technology -- not this shooting of boxes with wheels all over the place. SEND PEOPLE, and I will be proud."

[NASA administrator Charles Bolden](#): Manned missions to Mars are -- sometime in the 2030s, is among the most important goals of the agency.

But first, mission planners need more information about the Martian surface so they can choose the best landing sites.

"The reason to send humans will be because we have to," Bell says. "If some things can be done by robots, they should be done by robots. But sending a drill rig to Mars or Jupiter's moon Europa to tap into an aquifer that may have living organisms in it -- those kinds of things will require people."

Seriously, no matter how successful unmanned missions might be, robots will never replace the need for human space exploration, says Bell.

Why exploring mars?:

"It's human nature to explore," (NASA researcher). "By going to difficult or dangerous places, we carry the rest of our species along with us. These stories become part of part of our culture, part of our heritage, part of our shared need to explore the worlds around us. it's a human endeavor that is part science, part inspiration."

"If there's life or past life on Mars, it means the chances that life exists somewhere else are much higher," said David Paige, who studies the moon and terrestrial planets at UCLA. If Mars is barren, "it might make Earth more unique than we thought."

"A lot of the warmest feelings people have had around the world have had to do with the space program," Munson said. "It's hard to put a value on that."

Then there's the unknown value of newly discovered knowledge.

More visits to our next-door neighbor could answer lingering questions about Earth's history, reinforce U.S. prestige and get more children interested in science.

Space exploration is the ultimate status symbol. China and India have signaled their technological aspirations by establishing space programs. So have Iran, Pakistan, Venezuela, Israel, Mexico and dozens of other countries.

It also could bring humanity closer to answering the ultimate question: Are we alone in the universe? "It's the search for the meaning of life,"