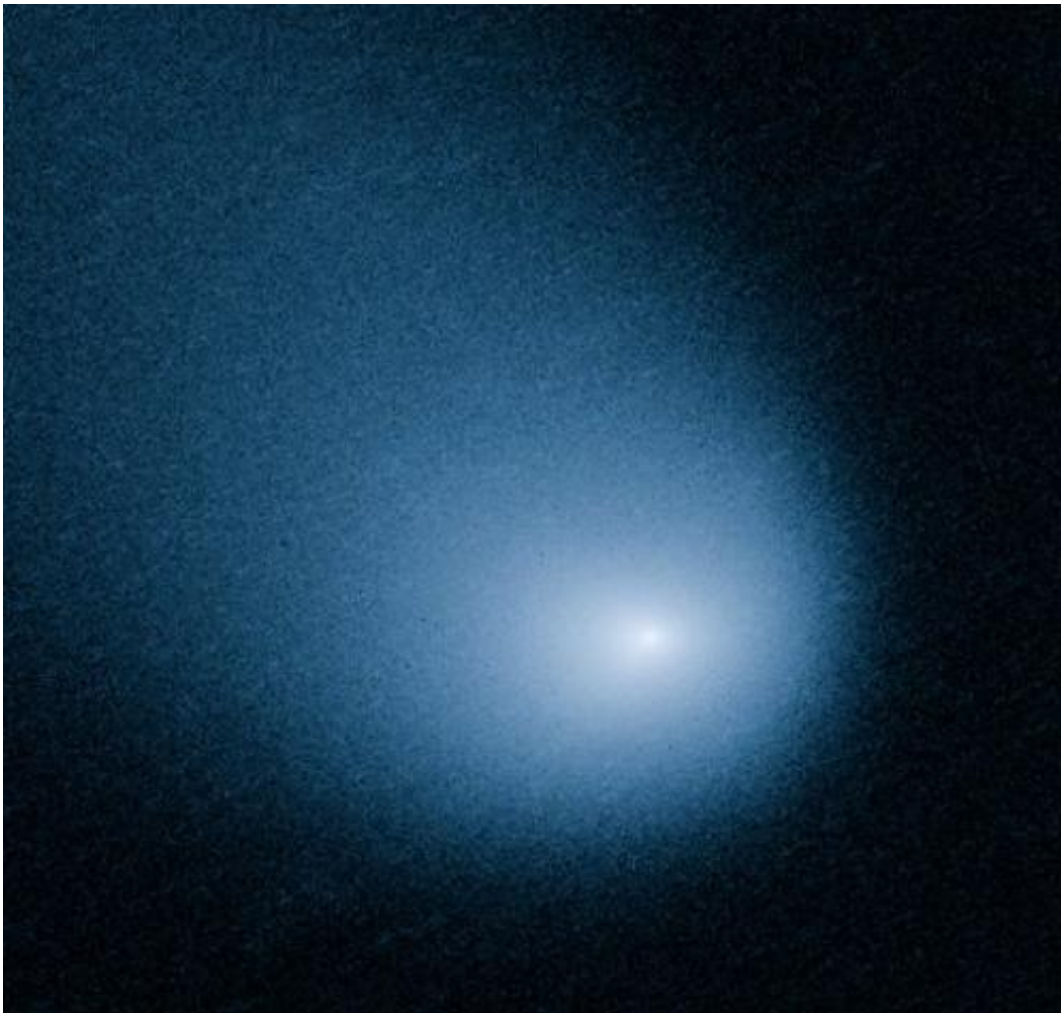


Once in million years: Comet buzzing Mars on Sun

October 16 2014, by Marcia Dunn



This March 27, 2014 image provided by NASA, ESA, and J.-Y. Li shows comet C/2013 A1, also known as Siding Spring, as captured by Wide Field Camera 3 on NASA's Hubble Space Telescope. (AP Photo/NASA, ESA, J.-Y. Li)

(AP)—The heavens are hosting an event this weekend that occurs once in a million years or so.

A comet as hefty as a small mountain will pass mind-bogglingly close to Mars on Sunday, approaching within 87,000 miles (140,006 kilometers) at a speed of 126,000 mph (202,767 kph).

NASA's five robotic explorers at Mars—three orbiters and two rovers—are being repurposed to witness a comet named Siding Spring make its first known visit to the inner solar system. So are a European and an Indian spacecraft circling the red planet.

The orbiting craft will attempt to observe the incoming iceball, then hide behind Mars for protection from potentially dangerous dusty debris in the comet tail.

Shielded by the Martian atmosphere, the Opportunity and Curiosity rovers may well have the best seats in the house, although a dust storm on Mars could obscure the view.

"We certainly have fingers crossed for the first images of a comet from the surface of another world," said NASA program scientist Kelly Fast.

Spacecraft farther afield, including the Hubble Space Telescope, already are keeping a sharp lookout, as are ground observatories and research balloons.

"We're getting ready for a spectacular set of observations," said Jim Green, head of NASA's planetary science division.

Named for the Australian observatory used to detect it in January 2013, Siding Spring will approach Mars from beneath and zoom right in front Sunday afternoon, Eastern Time.

On Earth, the best viewing, via binoculars or telescope, will be from the Southern Hemisphere—South Africa and Australia will be in prime position. In the Northern Hemisphere, it will be difficult to see Siding Spring slide by Mars.

The comet—with a nucleus estimated to be at least a half mile (.8 kilometer) in diameter—hails from the Oort Cloud on the extreme fringe of the solar system. It formed during the first million or two years of the solar system's birth 4.6 billion years ago and, until now, ventured no closer to the sun than perhaps the orbits of Jupiter, Saturn, Uranus or Neptune. It comes around every one or more million years.

It will be the first Oort Cloud comet to be studied up close in detail.

For comparison, the flyby distance of 87,000 miles (140,006 kilometers) is about one-third of the way from here to the moon. Siding Spring's tail could extend from Earth all the way to our moon. Its gaseous coma, the fuzzy head surrounding the nucleus, might stretch halfway to the moon.

No comet has come anywhere near this close to Earth in recorded history.

"We can't get to an Oort Cloud comet with our current rockets ... so this comet is coming to us," said Carey Lisse, senior astrophysicist at Johns Hopkins University's applied physics laboratory.

By studying Siding Spring's composition and structure, scientists hope to learn more about how the planets formed, according to Lisse. Scientists also are keen to spot any changes to the comet or Mars due to the close approach. NASA's newly arrived Maven spacecraft, for instance, will compare the upper atmosphere before and after it passes.

"Think about a comet that started its travel probably at the dawn of man

and it's just coming in close now," Lisse said. "And the reason we can actually observe it is because we have built satellites and rovers. We've now got outposts around Mars."

Scientists initially worried the spacecraft orbiting Mars would be at considerable risk from the comet's massive trail of dust.

The nucleus itself poses no danger of impact. But the particles in the tail, hurtling through space at 126,000 mph (202,767 kph) could fry electronics, puncture fuel lines, or destroy computers, transmitters or other vital spacecraft parts.

As Siding Spring's path became clearer, the threat level was deemed minimal. Still, space agencies are taking no chances. They're employing the "duck and cover" strategy.

NASA's three orbiters—Mars Odyssey, Mars Reconnaissance Orbiter and newcomer Maven—will be behind the [red planet](#) at the time of peak danger. That's a 20-minute-or-so period approximately 1½ hours after the closest approach by the [comet](#)'s nucleus.

The European Space Agency also shifted the orbit of its Mars Express as did India for its Mars Orbiter Mission, or MOM, the country's first interplanetary spacecraft that, like NASA's Maven, arrived last month.

The precautions are prudent, said University of Maryland senior research scientist Tony Farnham, who led a hazard-analysis team.

"Comets are complex beasts and don't always live up to our predictions," Farnham said in an email Wednesday. "If you don't want surprises, then don't study comets."

It will take at least a few days to obtain and analyze the best spacecraft

data; but images made from Earth should be forthcoming pretty quickly.

Siding Spring should pass closest to the sun six days after its Mars flyby, then swing back out, bidding goodbye, for at least another million years.

More information: mars.nasa.gov/comets/sidingspring/

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