

Scientists eagerly watch Jupiter

NEW YORK (AP) — Scientists are scrambling to take advantage of an unprecedented opportunity: the chance to watch a planet get bombarded by large chunks of a comet.

Up to 21 pieces of the comet will plunge one by one into Jupiter next July, and they may signal their doom with brilliant flashes and huge fireballs, some scientists predict.

The impacts may even produce some new storms on Jupiter like the planet's Great Red Spot.

"It's a once-in-a-lifetime deal" for scientists who study planets, said H. Jay Melosh, professor of planetary science at the University of Arizona. "You're poking at Jupiter and seeing what it will do."

Not all scientists believe the outcome will be so dramatic, but many researchers are enthusiastic. When Melosh convened a "Pre-Crash Bash" workshop in August on just two week's notice, a startling 120 scientists dropped everything to show up. And scientists are already planning studies from observatories worldwide and the orbiting Hubble Space Telescope.

"Every piece of glass on Earth or around Earth is going to be pointed at Jupiter next year," said Torrence Johnson, chief scientist for the Galileo space probe project, which he hopes will also get in on the action.

Scientists have never had a chance to watch a planet get hit by meteorites, let alone had so much lead time. Some comet fragments might pack more punch than anything that has struck Earth since humans appeared.

Observers on Earth will not see the impacts directly because they will occur on the far side of Jupiter. But the Galileo spacecraft, launched in 1989 and now well beyond the orbit of Mars, will be in position to watch.

"We're going to do our darnedest" to find money and time to arrange for observations, Johnson said.

Scientists are also investigating the possibility of reactivating cameras on Voyager 2 to sense light from the impacts, he said. That spacecraft, launched in 1977, is now sailing beyond all the known planets but could look back toward Jupiter from about 40 times the distance between Earth and the sun.

In any case, earthbound telescopes will not be entirely shut out. With luck, they may be able to detect the initial flash and later fireball if the light reflects off Jupiter's moons, scientists say. The impact sites will become visible from Earth a few hours after the crashes as Jupiter spins on its axis. And some of the most interesting effects of the crashes will occur away from the impact sites anyway, scientists say.

The excitement comes from Comet Shoemaker-Levy 9, discovered last March and nicknamed the "string of pearls" comet for the way its fragments are spread out. The comet had been ripped apart by Jupiter's huge gravitational pull.

The fragments are now orbiting Jupiter, and scientists have calculated that they will plunge into the planet over about six days in the latter half of

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July.

The size of the fragments is not clear, but current estimates for the biggest ones range from about a half-mile wide to less than three miles wide. They are expected to begin their plunge into Jupiter at a speed of about 37 miles per second, which even by astronomical standards is very fast.

They will not strike any hard surface because Jupiter is a gaseous ball only a little more dense than water, on average.

But as the chunks race at tremendous speed through progressively denser gas, they will crumble in perhaps 10 seconds or so, scientists say. At the same time, their energy will make the gas hot enough to form a fireball that rises back into Jupiter's atmosphere, researchers say.

Not everyone expects such a dramatic event. Brian Marsden, associate director for planetary sciences at the Harvard-Smithsonian Center for Astrophysics, said he believes Jupiter's gravity will further break up the comet chunks until they are quite small before they strike the planet.

"We could be dealing with just a stream of dust," he said.

Scientists should watch for effects of the impacts, he said, but "I really would not be surprised if we don't notice anything at all."

Still, scientists who are betting on substantial impacts say the event could teach a lot about Jupiter:

- Substances now hidden under the planet's ammonia clouds might be blown into view, shedding light on Jupiter's inner chemistry.
- Seismic waves that travel through the planet might tell about the composition and structure of its interior.
- Clouds that form after the impacts might reveal high-altitude circulation in Jupiter's atmosphere.
- Energy waves spreading from the impacts could tell about the structure and stability of Jupiter's atmospheric layers.
- Other observations could shed light on the planet's dozen jet streams.
- Outside the atmosphere, thin clouds of dust from the comet chunks might help scientists map Jupiter's magnetic field.

Unfortunately, effects of the impacts will probably not be visible to amateur astronomers, said astronomy Professor Michael A'Hearn of the University of Maryland.

If they have a good enough telescope to see Jupiter's cloud structure now, "there's a chance that they may see something," he said, "but they probably will not."



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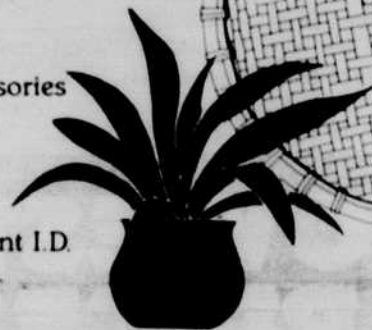
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