

NASA doesn't have a space vacuum, so how do we keep space clean?

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Image 1. There are a lot of satellites floating around space with nowhere to go. Scientists are working on getting rid of the satellites that are no longer working in space. Image from NASA.

The night sky is full of stars, but it's also full of garbage.

Humans put lots of satellites up into space. About 1,700 working spacecraft are in orbit around our planet today. And not every piece of machinery comes right back to Earth when its job is done. Many keep speeding through the sky long after scientists have lost contact with them. Sometimes these leftover spacecraft crash into one another. They can break into small pieces.

Speeding Space Debris

The National Aeronautics and Space Administration (NASA) is the U.S. space agency. This group estimates that there are about 23,000 pieces of space debris larger than 10 centimeters. That's about four inches. The group also estimates there are about 500,000 pieces of space junk larger than one centimeter. And there are 100,000,000 pieces larger than one millimeter. That's about the size of a sesame seed.

A piece of metal that small might not sound dangerous, but even these tiny bits can pose a big risk.

The International Space Station orbits about 200 miles above Earth. Astronauts live on the space station. They run experiments there to learn more about outer space. The ISS can fly around the paths of the most dangerous hunks of junk. But it only takes a tiny piece of space garbage to damage the station. Tiny flakes of paint have chipped the craft's quadruple-thick windows. That's because space garbage moves fast.

J.D. Harrington is a public affairs officer at NASA. He says that space garbage moves at "more than 10 times the speed of a bullet." That means that even tiny bits of debris are a threat to astronauts when they do spacewalks outside of the International Space Station.

Small debris can punch a hole in a satellite. Larger debris can crush one entirely — creating even more wreckage.

A Real Threat To Current Space Exploration

"The threat from orbital debris is real," Harrington says. Future missions are expected to produce more space garbage. That will only cause the problem to get worse, Harrington said. It will present an even greater danger to future space missions.

In recent years, it has become easier and cheaper to send objects into space. That has led to an increase in space traffic. Countries, private companies and research groups have been sending more objects up into space. If this doesn't stop, our corner of space will have less and less space over time.

NASA doesn't have plans to clean up what's already there. However, the agency is working to keep the problem from getting worse. It is ensuring that each new mission includes plans to dispose of spacecraft that no longer work. The plans include pieces of debris that are ejected, too.

NASA isn't the only one with plans to solve the space garbage problem. There are solutions in the works from others as well. A few ideas were discussed at the 2017 European Conference on Space Debris. Some scientists suggested pushing junk into a higher orbit. Others liked the idea of capturing it with nets and harpoons or even magnets.



RemoveDEBRIS

In May, the International Space Station is going to try an experiment called RemoveDEBRIS. It was designed by a team at the University of Surrey in England. RemoveDEBRIS will capture several pieces of pretend garbage as a test. Then it will burn itself up in Earth's atmosphere. That is the layer of gases around the planet.

Are people on Earth safe from the danger of falling debris? The short answer is yes. Space junk falls down all the time. Two hundred pieces of debris fell into the atmosphere in 2016. Most of it burns up and breaks down in the process. The pieces that remain are unlikely to cause harm. Most

of the Earth is either covered in ocean or has plenty of open space. Chances are any hunks of junk will hit spots without humans there to get hurt.

There's only one known case of a human getting hit with a piece of spacecraft. Lottie Williams was hit in 1997 in Tulsa, Oklahoma. She didn't even get a bruise! You're way more likely to get struck by lightning than to get hit by falling space junk.

Quiz

1 Read the paragraph from the introduction [paragraphs 1-2].

Humans put lots of satellites up into space. About 1,700 working spacecraft are in orbit around our planet today. And not every piece of machinery comes right back to Earth when its job is done. Many keep speeding through the sky long after scientists have lost contact with them. Sometimes these leftover spacecraft crash into one another. They can break into small pieces.

How does this paragraph support the MAIN idea of the article?

- (A) It describes some of the solutions that scientists have for getting rid of space junk.
- (B) It shows that space junk will eventually put people on Earth in very unsafe situations.
- (C) It explains the effects that satellites have on helping scientists predict the weather.
- (D) It provides an explanation for why there is a big problem with garbage in space.

2 One MAIN idea of the article is that thousands of pieces of space debris are orbiting Earth.

What is another MAIN idea of the article?

- (A) Astronauts live on the International Space Station about 200 miles above Earth.
- (B) The International Space Station plans to try an experiment called RemoveDEBRIS in May.
- (C) NASA and others are working to find solutions to the space garbage problem.
- (D) Only one person is known to have been struck by a piece of falling space debris.

3 What effect does space debris have on people on Earth?

- (A) It has a deadly effect because hundreds of pieces of debris fall to the Earth every year, causing many injuries.
- (B) It has a big effect because the space debris falls through the sky at a high speed, causing it to burn.
- (C) It has a small effect because space debris doesn't leave bruises even though it hits people often.
- (D) It has very little effect because the pieces nearly always land in the ocean or in open spaces.

4 According to the section "A Real Threat To Current Space Exploration," how does NASA plan to help the space junk problem?

- (A) NASA has put a rule into place that requires space missions to have a plan for removing spacecraft that no longer work.
- (B) NASA does not have any real plans to clean up either existing space junk or space garbage created in the future.
- (C) NASA created a new program that is trying to figure out ways to push the junk into a higher orbit.
- (D) NASA is working on a project that will capture space junk with nets and harpoons before sending it to Earth's atmosphere.