

FUTURES

What if...

...THERE WAS A WAY TO CLEAN UP THE JUNK?

For now, space debris only leaves orbit when it finally loses altitude, falls into the Earth's atmosphere and burns up. But although reentry removes tons of space garbage every year, even bigger piles are created.

Several technological solutions have been proposed, but the orbiting trash has evaded them all. One plan involves floating a huge umbrella to catch the debris. But because the pieces are scattered across such a wide orbital band, it would be impossible to build a structure large enough to catch them all.

Another idea involves the use of high-powered lasers to pulverize debris on a collision course with spacecraft.

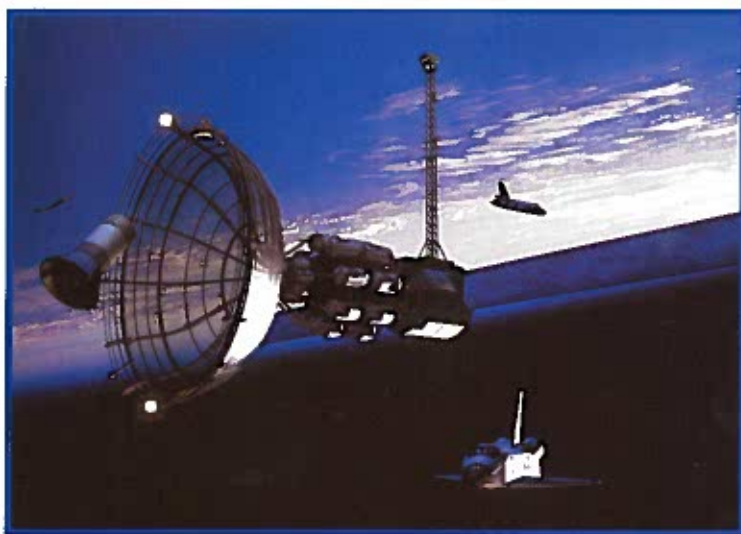
This too is impractical. The launch of so much hardware would involve tremendous costs, and lasers could even make the situation worse. Debris is dangerous whatever its size, and blasting it apart would only create more fragments capable of inflicting damage.

The world's space agencies take the problem of orbit debris very seriously. The Inter-Agency Space Debris Coordination Committee has been formed to direct the design of future spacecraft, and it may not be long before a new breed of orbit-friendly rockets zooms into space. Eventually, all satellites and the upper rocket stages will have to carry enough fuel to clear busy orbits once their

mission is completed. They will either be taken down to low orbit to accelerate their fall to the Earth, or boosted up to higher orbits out of the way. Astronauts have also been told to keep a firmer grip on their possessions while they are out spacewalking.

Spacecraft that clean up after themselves may stall the creation of new junk, but it will be a long time before orbits become trash-free.

So, for the foreseeable future, engineers are having to build tougher spacecraft. Debris poses a major threat to the International Space Station (ISS), which will be the most heavily shielded spacecraft ever flown—debris of up to half an inch diameter will bounce off its thick metal guards without leaving a scratch. In addition, the ISS's orbit path will be adjusted if tracking stations predict an impact with debris larger than four inches. But some collisions are inevitable, and if the ISS ever returns to Earth, it will not be without a few bruises.



An old rocket booster falls into the mouth of the Space Vacuum—an orbital cleaner that transfers crushed debris into Space Shuttles for disposal. Space junk is so scattered that it takes a fleet of cleaners to dent the flying garbage pile.