Space: the final junkyard

The writer has a basic premise but it is sensationalized. Leaky reactors? Lasers to "sweep space? Debris that threatens a cosmic explosion?

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Outer space is fast filling up with human-generated junk, from exploded satellites to leaky nuclear reactors, and the debris threatens the safety of cosmic exploration.

International agencies have met for years to try to solve the problem. One possible solution is to encourage space-launching nations to build sturdier rockets that don't blow up in space and spew debris everywhere, ones that burn up in the Earth's atmosphere upon their return.

Another is to have inventors develop futuristic laser beams that can "sweep" space junk from the skies.

Meanwhile, the space-junk problem is getting worse as the terrestrial world becomes more and more reliant on the sky: We increasingly depend on satellites for duties as diverse as cell-phone calls, TV broadcasting, military reconnaissance and guided hikes by global positioning systems. Satellites are used to track robotic minisubs in Antarctica and animals in the wild.

Space junk ranges from human waste to a discarded Russian spacesuit. The latter was recently dumped by the crew of the international space station; later this year, it should fall back to Earth in a blaze of glory. In the 1960s, U.S. tracking systems monitored an American astronaut's discarded glove, which eventually returned to Earth. This summer, a Russian cosmonaut reportedly plans to hit a gold-plated golf ball from the international space station as part of a paid promotional stunt for a golf-club firm in Toronto. That'll add to the floating litter.

About 18 collisions of existing satellites - 11 of them "catastrophic" to the objects that collide - will probably occur over the next 200 years, even if Earth never launches another rocket, reported two officials at NASA's Orbital Debris Program Office in Houston in the Jan. 20 issue of Science magazine. In reality, wrote Jer-Chyi Liou and Nicholas Johnson, the actual number of collisions "will undoubtedly be worse" because new spaceships - that is, future space debris - are continually being launched.

"Since the launch of Sputnik 1 (in 1957), space activities have created an orbital debris environment that poses increasing impact risks to existing space systems, including human space flight and robotic missions," Liou and Johnson said.

Especially endangered, some experts say, is the most romantic notion on visionaries' wish list: the "space elevator." As proposed, the elevator would be a titanic, super-strong metallic ribbon stretching from close to Earth's surface to a point more than 60,000 miles high, on which elevators would ferry freight and humans into space at bargain-basement rates.

"Low Earth orbit," as it's called, is so packed with debris and satellites that a collision with the elevator, if it's ever built, is a near certainty. One expert's calculations show satellites and debris might collide with the elevator up to several times a year unless the elevator is continually monitored and moved out of the way of an incoming projectile.

"I would love to ride a space elevator to orbit in a few decades - and I don't want to have to dodge space debris as I'm passing the 1,000th floor!" said George Whitesides, executive director of a leading space activists' group, the National Space Society in Washington, D.C. "We need to control space debris today to make future space development truly feasible."

Space collisions aren't just a futuristic threat: NASA and the world's other space agencies have been dodging celestial bullets ever since the first satellites soared heavenward a half-century ago. When space shuttle astronauts visit satellites to repair them, they find the crafts pitted with tiny craters - the result of high-speed collisions with paint flecks or other debris. A paint fleck might sound trivial, but as every high school physics student knows, a mere speck carries a lethal punch when it's flying at several miles per second.

Fortunately, paint flecks and much larger debris - dead satellites and discarded booster rockets - eventually fall back to Earth and burn up in the atmosphere. But some debris is orbiting so high that it won't return to Earth for thousands of years. And the satellites and other discarded equipment that make up that debris will be ramming into each other, spewing paint flecks and transistors and rubber tubes like busted piqatas at a children's party. As a result, experts say, the overall amount of space debris will grow for decades even if NASA and every other space agency never launches another rocket.

"We still have a lot of stuff up there that was put up there years ago, and it is going be there for a long time," said aerospace engineer William Ailor, director of the Center for Orbital and Reentry Debris Studies at the Aerospace Corp. in El Segundo (Los Angeles County). Until such high-flying swarms of junk return to Earth, they'll continue colliding with one another, generating even more junk. "We've got more collisions coming - it's going be a fact of life," Ailor added.