Space sustainability and debris physics: The role of reentries

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THE ROLE OF REENTRIES

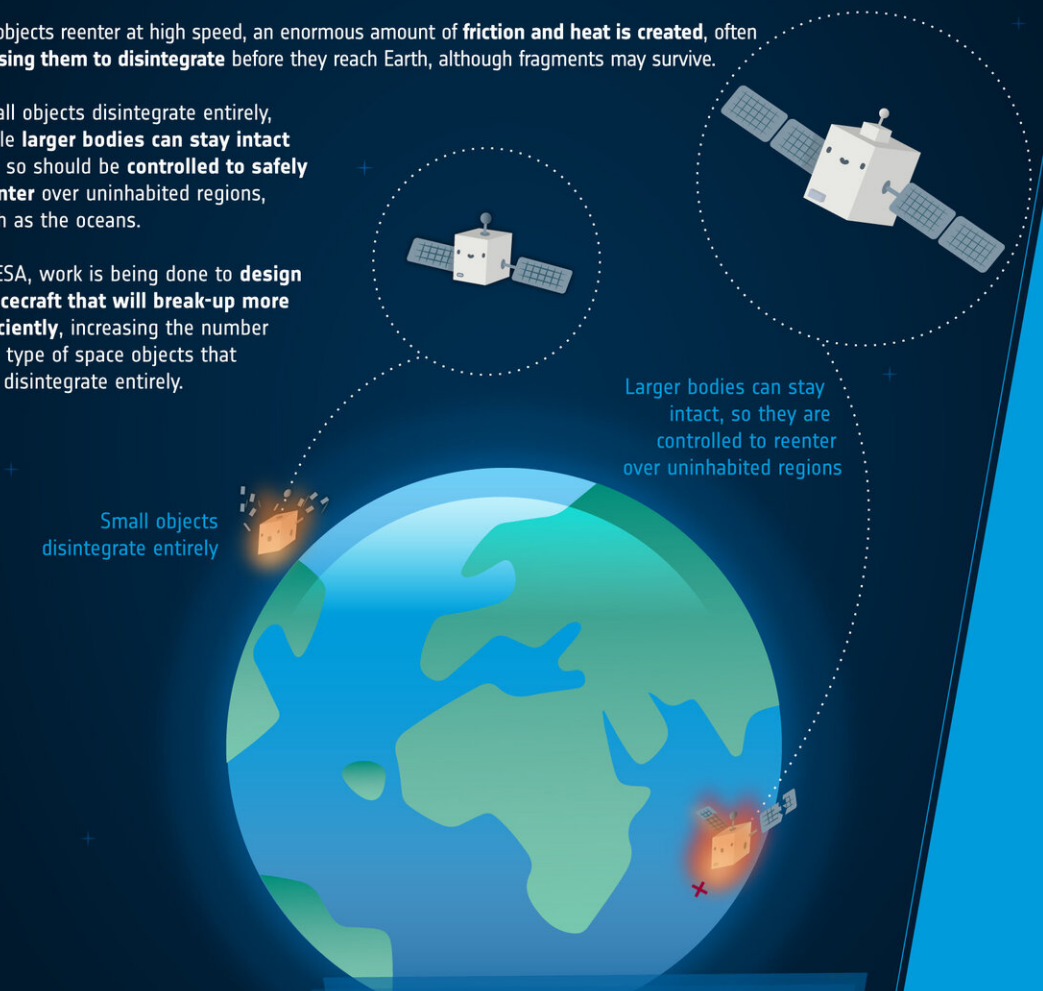
Every mission comes to an end – what then?

Rockets and satellites left in orbit can collide, creating dangerous debris. To comply with international debris mitigation guidelines, those in low-Earth orbits **should be designed to safely reenter Earth's atmosphere.**

As objects reenter at high speed, an enormous amount of **friction and heat is created**, often **causing them to disintegrate** before they reach Earth, although fragments may survive.

Small objects disintegrate entirely, while **larger bodies can stay intact** and so should be **controlled to safely reenter** over uninhabited regions, such as the oceans.

At ESA, work is being done to **design spacecraft that will break-up more efficiently**, increasing the number and type of space objects that can disintegrate entirely.



Every year in the last decade saw about 100 satellites and rocket bodies reenter Earth's atmosphere, with a total annual mass of roughly 150 tonnes (similar in weight to a small house!). Managing reentries is a fundamental aspect of ensuring the sustainable use of space.

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Credit: ESA / UNOOSA

What goes up, nearly always comes back down. When it comes to the objects we send to space, atmospheric reentries are actually a fundamental tool in minimizing the creation of space debris and ensuring a sustainable future in space.

Objects in low-Earth orbit, affected by the 'drag' forces caused by Earth's atmosphere, gradually lower in altitude and then make a rapid and firey descent towards Earth.

Small objects disintegrate as they reenter due to the immense friction and heat created, but parts of larger bodies can reach the ground so should be controlled to land over uninhabited regions.

Join Stijn Lemmens and Jorge del Rio Vera to find out more about why this matters in the joint ESA-UN podcast that narrates this infographic.

Provided by European Space Agency

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