

The problem of space pollution

FEBRUARY 10th 2009 began like every other day in *Iridium 33's* 11-year life. One of a constellation of 66 small satellites in orbit around the Earth, it spent its time whizzing through space, diligently shuttling signals to and from satellite phones. At 3pm a report suggested it might see some excitement: two hours later it would pass
5 less than 600 metres from a defunct communications satellite called *Cosmos 2251*. It did. A lot less. The two craft collided and the result was hundreds of pieces of shrapnel more than 10cm across, and thus large enough to track by radar—and goodness knows how many that were not. This accident and another one in 2007
10 increased the number of objects in orbit at an altitude of 700-1,000km by a third. Such low-Earth orbits, or LEOs, are among the most desirable for artificial satellites. They are easy for launch rockets to get to, they allow the planet's surface to be scanned in great detail for both military and civilian purposes, and they are close enough that even the weak signals of equipment such as satellite phones can be detected. Losing the ability to place satellites safely into LEOs would thus be a
15 bad thing. And that is exactly what these two incidents threatened. [...]

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Vocabulary:

- whizzing: moving at very high speed
- defunct: dead
- pieces of shrapnel: pieces of metal flying in all directions

Questions:

1. Present the text, and sum it up in your own words.
2. Explain (lines 4 to 6): "...a report suggested it might see some excitement: two hours later it would pass less than 600 metres from a defunct communications satellite called *Cosmos 2251*. It did. A lot less."
3. Using one of the Kepler's laws, what is the speed v of a satellite in uniform circular motion at an altitude h above the ground?
4. What are the different steps of a "rocket launch" ?
5. Why are artificial satellites so important?