<p style="font-weight:normal;font-size:14px;">Since the beginning of the space race in 1957, the number of objects sent into orbit is continuously growing, as does the amount of space debris orbiting the Earth. This is becoming a real threat for operational space missions around the Earth. Space debris can be the result of:</p>

\* <p style="font-weight:normal;font-size:14px;">A collision between two satellites, two debris or a satellite and a debris/meteoroid</p>

\* <p style="font-weight:normal;font-size:14px;">A battery which became unstable and exploded</p>

\* <p style="font-weight:normal;font-size:14px;">Fuel leftovers in a satellite or a launcher stage which became unstable and exploded</p>

\* <p style="font-weight:normal;font-size:14px;">A planned destruction</p>

\* <p style="font-weight:normal;font-size:14px;">An out of control satellite or a launcher stage</p>

Today, the population of space debris is estimated to be more than 500 000 trackable objects where 20 000 of them are bigger than a tennis ball. In addition, there are millions of pieces too small to be detected.

<span class="" style="font-size:14px;font-weight:normal;">The vast majority of space debris is located in Low Earth Orbit (LEO) where most space missions are located or planned. </span>''<u>Figure 1</u>''<span class="" style="font-size:14px;font-weight:normal;"> illustrates the distribution of debris around the Earth in 2013.</span>

[[File:Space\_debris\_story\_video\_production\_full.png|thumb|300px|Figure 1 : Representation of the distribution of the space debris in LEO in 2013. Source: ESA|centre|link=http://ece3sat.wikia.com/wiki/File:Space\_debris\_story\_video\_production\_full.png]]

<span class="" style="font-size:14px;font-weight:normal;">Even with the direct threat to space missions that space debris represents, the real threat comes in the long-term management of the Earth orbit. Indeed, the Clean Space department of ESA calculated that the population of debris would keep on growing in an exponential way if the space industry does not change or if every space activity stops (</span><u style="font-size:14px;">''Figure 2''</u><span class="" style="font-size:14px;font-weight:normal;">); thus preventing any orbital activity. The same forecast considered the limitation of debris creation, End of Life (EOL) management, debris removal and the limitation of orbital objects.</span><p style="text-align:center;">[[File:Why\_Space\_Debris\_Mitigation\_is\_needed\_large.gif|thumb|300px|Figure 2 : Space debris population forecast in 2209 if nothing is done to mitigate them|centre|link=http://ece3sat.wikia.com/wiki/File:Why\_Space\_Debris\_Mitigation\_is\_needed\_large.gif]] One part of the implementation of the space debris mitigation is made through the development of solutions to give the tools to the new satellites to perform deorbiting maneuvers to either cemetery orbits where the satellite is passivized (batteries and tanks emptied) or toward Earth to disintegrate upon re-entry into the atmosphere. Several types of deorbiting systems are currently being developed such as the aerodynamic sail, chemical engine, and electric/ionic engine.</p>