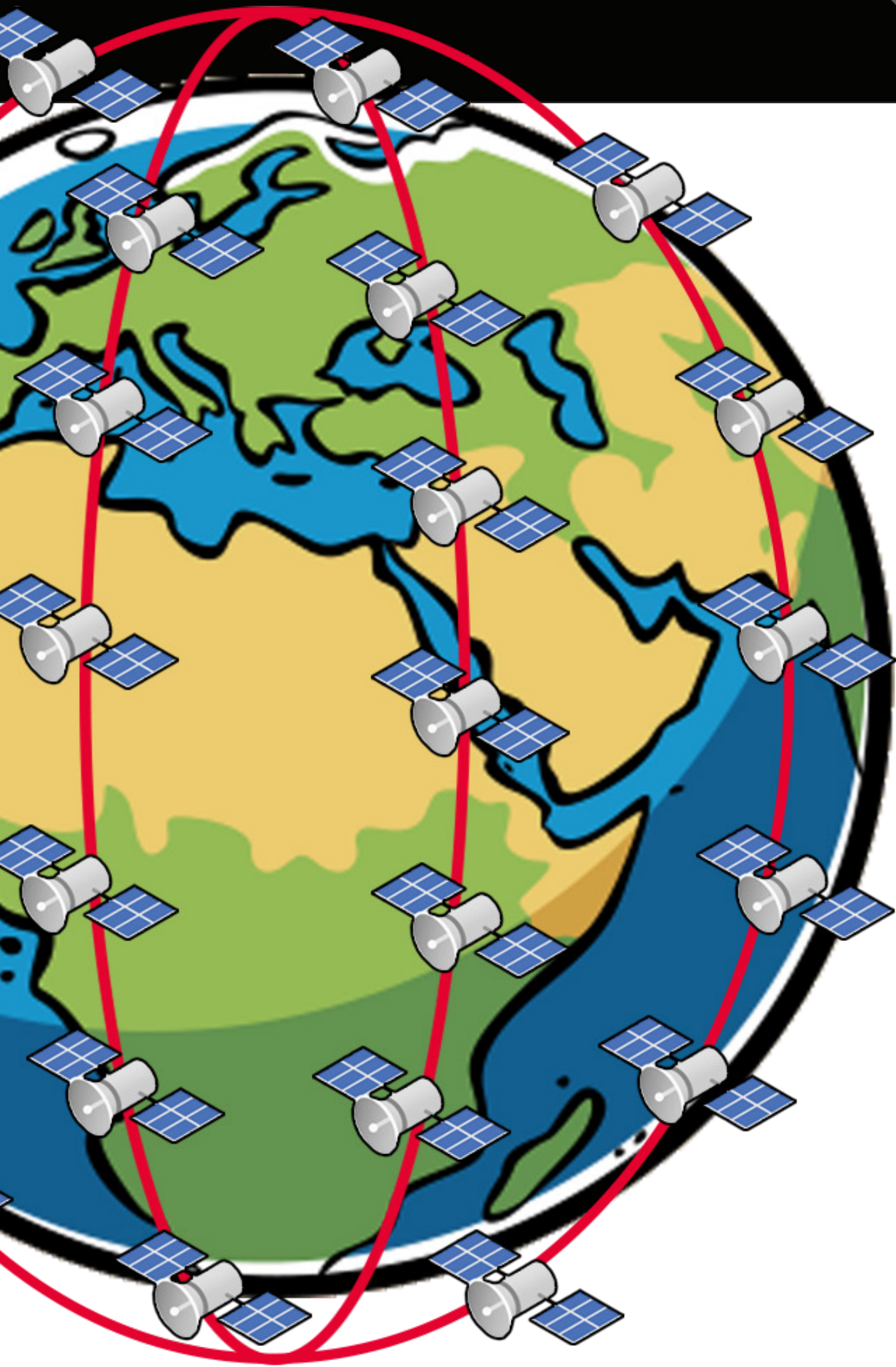


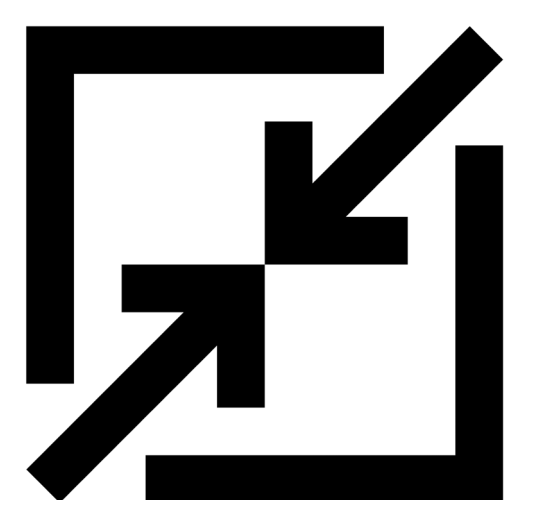
WHAT IS A SATELLITE CONSTELLATION?



A satellite constellation is a space infrastructure composed of a multitude of relatively small spacecraft orbiting in formation around the Earth to provide a global service. The most famous example of satellite constellation is GPS, which provides global positioning services to devices like our smartphones.

With a given budget it is possible to build a small constellation of large satellites, or a large constellation of smaller satellites. The physical dimension of a constellation's spacecraft provides an upper limit to the performance of the onboard instruments and, consequently, to the precision of each individual measurement they have to perform (for example, the resolution of a lens). The amount of spacecraft in a constellation determines the frequency of the measurements, in other words how much time passes between two consecutive measurements over a given area of the globe.

The current trend towards larger constellations of smaller satellites is justified by advances in miniaturization, which enables smaller, high performance payloads, and the progressive decrease of launch cost, which allows satellite operators to launch up to a hundred small spacecraft at a time.



Smaller satellites are easier to design, evolve, and mass produce. While the resolution of their instruments is comparatively low, it is possible to synthesize higher resolution measurements via software by combining several samples captured in short sequence, in way that is similar to how smartphones can synthesize 360° panoramic shots from a camera panning. Because of their shorter lifetime, spacecraft are subjected to a quicker refresh cycle that maintains the whole constellation technologically up to date.

One of the biggest challenges in setting up a constellation is the time required to distribute a batch of satellite along an orbital plane. Smaller satellites usually have limited propulsion capabilities, so operators exploit orbital anomalies (similar to ocean currents) to slowly drift spacecraft into their operational position in a process that can take up to 10-12 months.

ION Satellite Carrier helps satellite operators to plan a more rational deployment of their constellations by delegating the precise positioning of their spacecraft to a specialized vehicle that can efficiently change its orbital parameters before each release. This feature also allows satellite manufacturer to design simpler, lighter satellites, making a more efficient use of the mass budget available.

