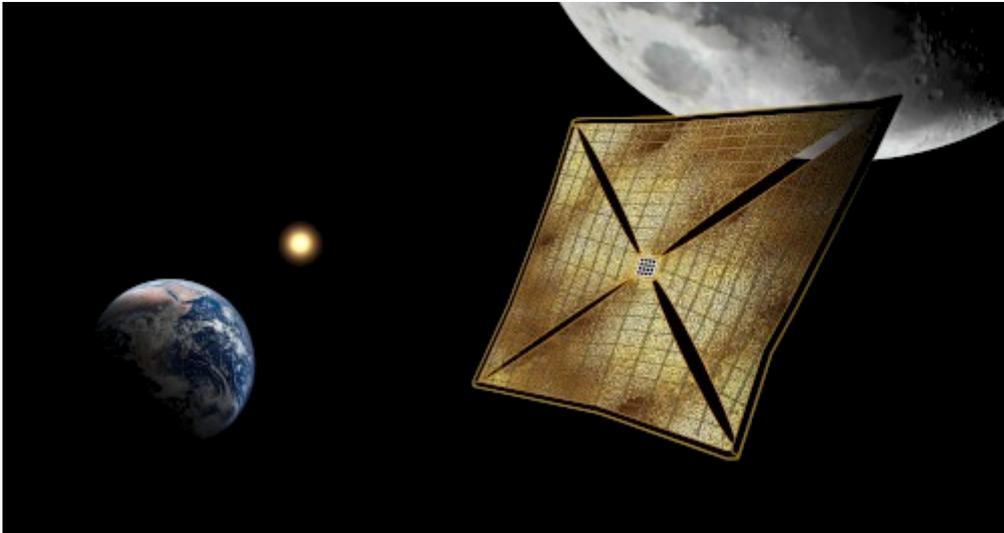


Satellite Swim Lane

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On November 4, 2022, France and Spain partially closed their airspace, following the uncontrolled fall of the central stage of a Chinese rocket. It hit the Earth in the middle of the Pacific Ocean. Events of this kind are rare for the moment, but with the development of spaceflight, the risk becomes greater.

If at the beginning of its conquest, space was reserved for industrial powers like the USA or the USSR, today, we have entered the era of small satellites. While launcher technology remains controlled by the major powers, satellites have become affordable to many players: small countries, "third world" countries, universities, and even small companies.

Until now, CubeSats have been limited to low earth orbits (LEO), but solar sail propulsion opens the door to the solar system and even the Universe. The question of responsibility then arises: the trajectory of any new satellite must respect the spatial environment already in place!

During its flight, our Payenkeu Cubesat will go through a delicate phase: the deployment of its sails. This phase is carried out using ion engines which will first stabilize the satellite, and then give it sufficient rotational speed to deploy its sails. During this sensitive maneuver, a loss of control during this maneuver could have serious consequences.

For example, the sailboat with part of its sails out, could gain altitude without being controlled. It would then become a potential danger for the other satellites revolving around our planet, thus generating international legal risks.

To anticipate the good behavior of our Payenkeu Cubesat, we are planning a pool simulation of this phase of flight. We want to immerse it in a swimming lane of a swimming pool and will control it by electromagnetic waves to make the final adjustments.

This crucial, low-cost test phase seems to us to be a vital step in the viability of our satellite.