



Al Falah Private Schools in
Makkah Al Mukarramah

Applied research on space waste and how to dispose of it

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World Space
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World Space Week 2022

Under the banner of space and sustainability

How can we clean satellite orbits?

research aims :

- Maintaining the continuity of space research and technology.
- Keeping satellite orbits around the Earth clean.
- Reducing the cost of maintaining satellites by reducing the chances of them colliding with foreign objects.

- Quoting the Euronews news agency, the Italian Space Agency has detected about 18,000 strange objects due to the debris of the old satellites, which leads to their collision with the rest of the healthy satellites and causing them to become damaged.
- So, for the continuation of space technology and research, we must clean the orbits of the satellites from the remnants of the destroyed satellites and allow others to work.



Steps towards the solution

Firstly, the study of the satellite body:

If we analyze the satellite parts, they contain iron parts such as screws, etc., and iron, a metal that is affected by magnetic fields and accepts magnetization.

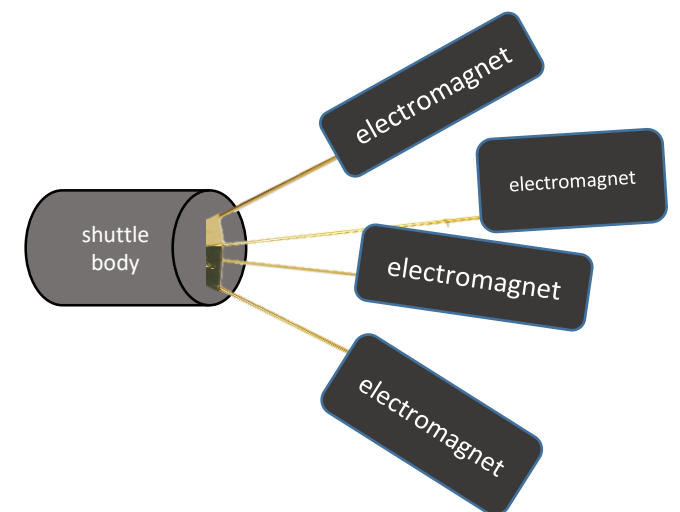


Suggested solution to this problem

By studying the bodies of the satellites, we propose the work of a space drone that operates with an ion engine, with ends on which electromagnets are installed.

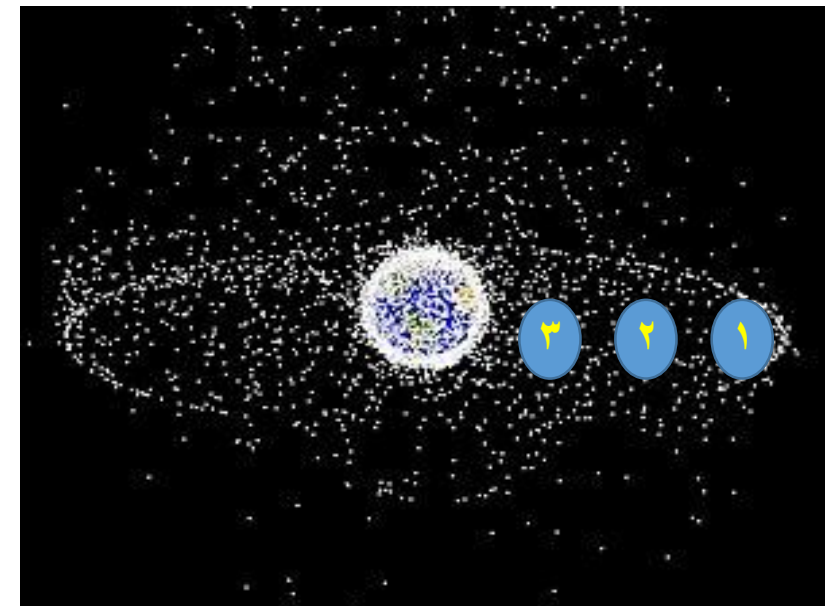
The way it works :

1. As it moves through the wreckage, it collects objects and debris that have any iron pieces
2. We direct it out of the Earth's gravitational field
3. When we reach it beyond the limits of gravity, we separate the electromagnets and launch those objects into distant space
4. Put the shuttle back into orbit and collect
5. more debris, and so on.

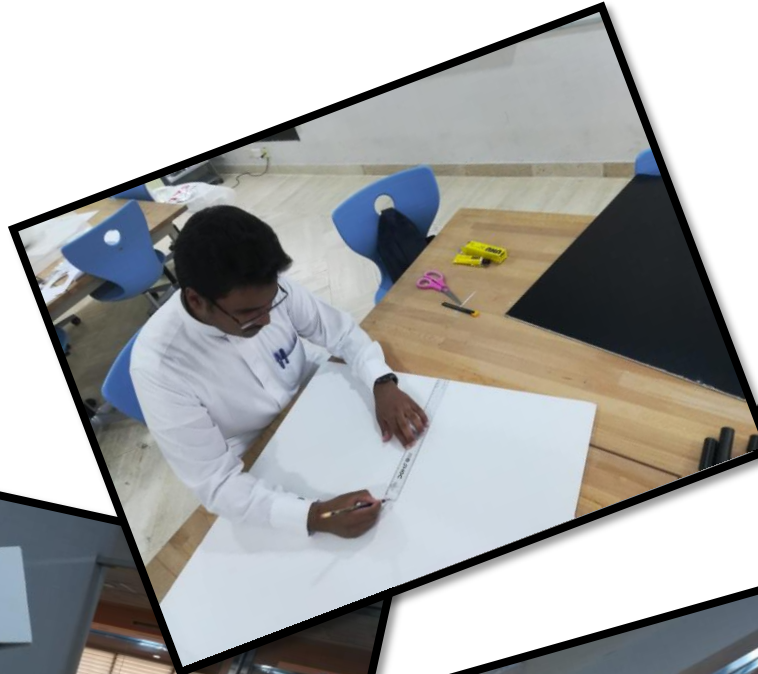


Expected problems of this shuttle

- The shuttle could attract healthy satellites
- The solution is that we will place sensors for electromagnetic waves on it. If it senses any source close to those waves, this is evidence that it is approaching a healthy moon and automatically moves away from it.
- 2. During its exit or entry, it may collide with debris that has not yet been collected, and thus the shuttle may crash
- The solution starts from the orbits farthest from the earth first, then the closest orbits, then the closest, as shown in the figure.



Project execution





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Search conclusion

There is no room for the sustainability of space research except by keeping space clean for future generations

Research sources

- Wikipedia: <https://en.wikipedia.org/>

- Ars technica <https://arstechnica.com/>

- Popular science <https://www.popsci.com/>

- NASA's Space Debris Program Office:

<https://www.orbitaldebris.jsc.nasa.gov/>

- https://www.youtube.com/watch?v=rbQ7aGT6CAU&ab_channel=euronews%28%D8%B9%D%D0%D8%B1%D8%A8%D{A%29}}