SPACE GENERATION ADVISORY COUNCIL

3rd ITALIAN SPACE STARTUP COMPETITION
NOVEMBER 20th and 21st, 2021

3RD ISSC MILANO

ORS: Orbit Recharge in Space

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Problem

With a growing number of spacecraft and lunar/interplanetary missions in the near future, we see the necessity of revaluating the concept of spacecrafts introducing in-orbit energy recharging.

- Currently, energy production on spacecraft is on-situ: they either produce all their energy or bring along a limited amount for their mission.
- This could represent a significant limiting factor in a future where the number of spacecraft and the number of lunar and eventually interplanetary missions will increase.

Solution: a cluster of solar panel satellites

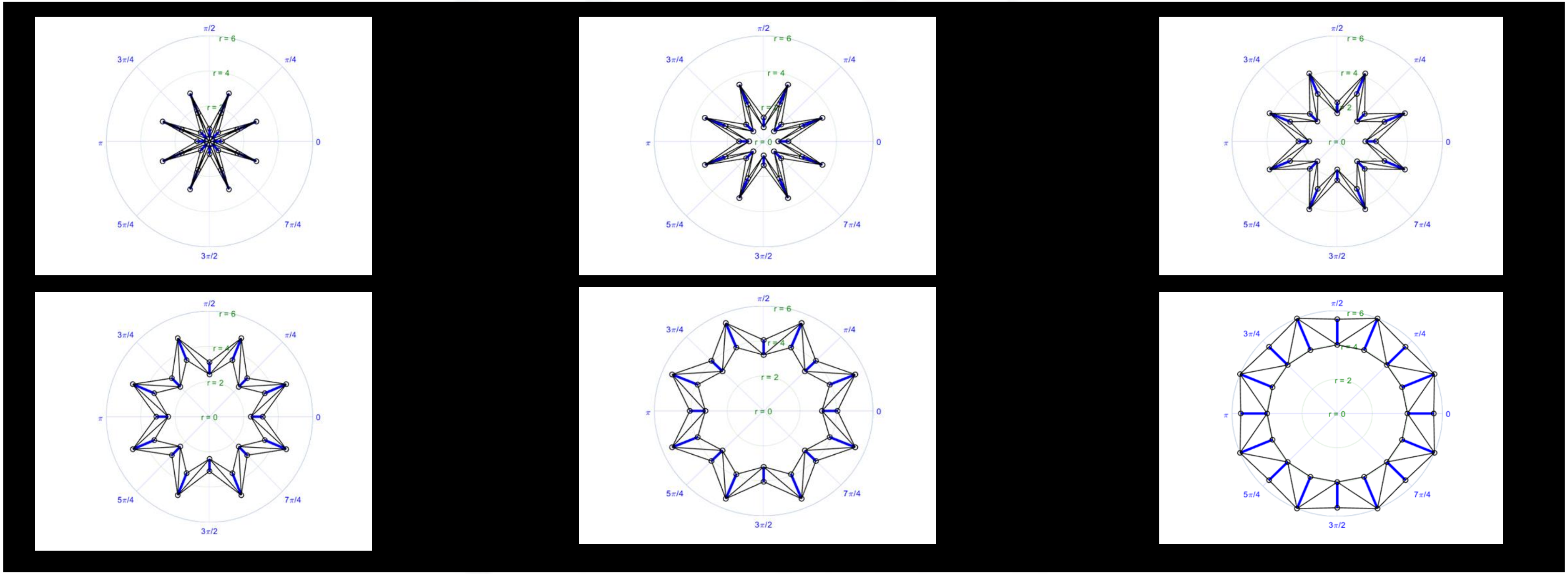
The concept of the service offered is wireless recharging in space, through satellites whose only scope is to collect the sun's solar energy and beam it to an external user.

The cluster is launched and deployed in a commercially useful orbit, stores energy in its batteries and transfers the power requested through beamed EM waves.

The satellites collaborate on orbit to achieve a functionality a system-wide functionality.

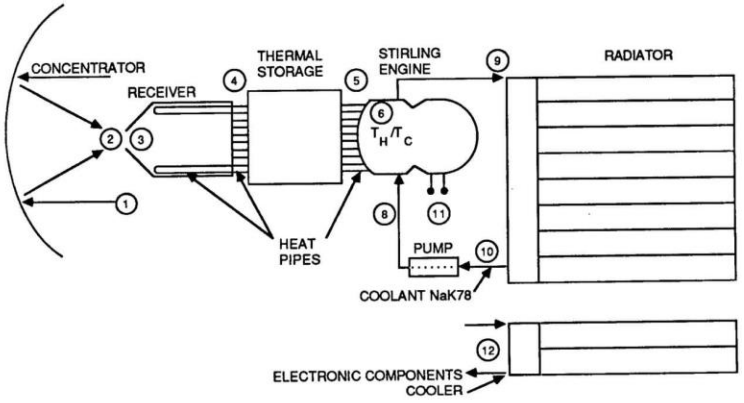
Solution

Wireless recharging: energy collection through solar panels and power beaming



Solution

Every satellite of the cluster beams electromagnetic waves to a current converter installed on the receiving spacecraft. This solution eliminates the spacecraft's need to produce its own energy. The waves are absorbed by the receiver, transformed in heat in a thermal storage unit, powering a Stirling engine from which electric energy is obtained.



Competitors

Solar panel producers

The current state of the art for space solar cells are multijunction GaAs cells with a substantially higher cost than terrestrial silicon solar cells. Being a life-limiting component on most spacecraft, their end-of-life is critical.

Available manufacturers are: Azur Space, AolAero, SpectroLab, Emcore

With this solution we would like to reduce costs and weights of a spacecfraft, as well as significantly lengthen its operating life.

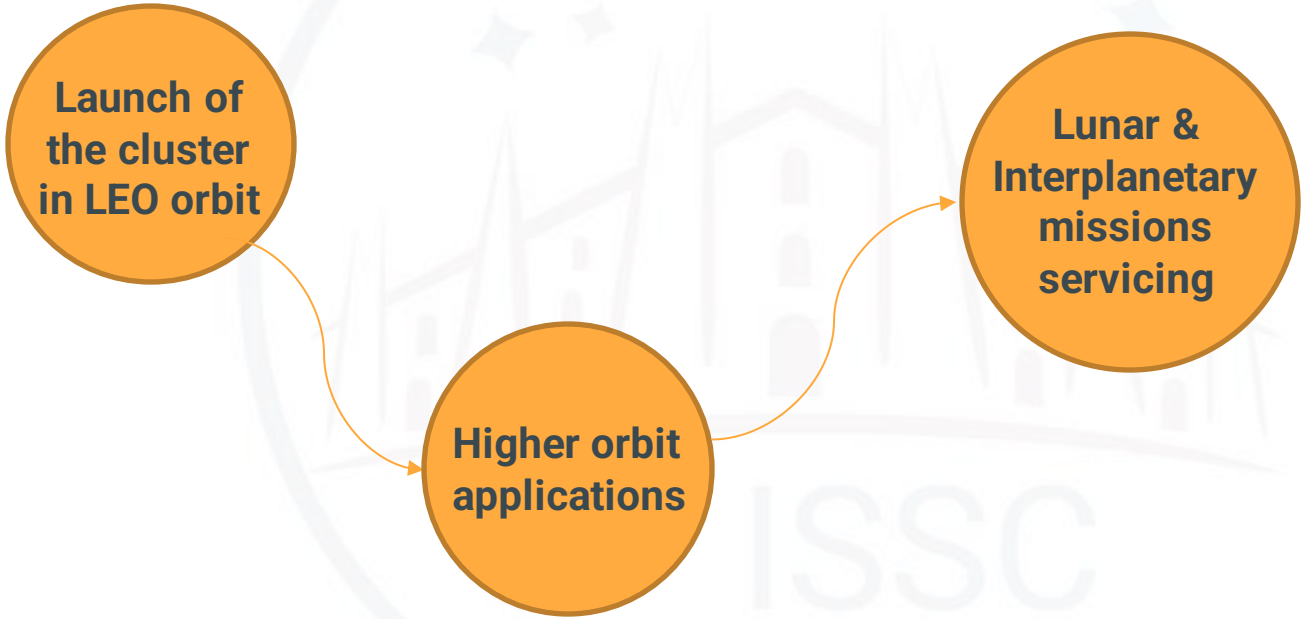
Customers

All companies that deal with spacecraft launches into orbit may be hypothetically interested in this project, given the cost and weight savings to be carried on board the spacecraft.

Furthermore, the future prospects would be to increase the number of our constellations in order to expand our market to different orbits and increase the reliability of electromagnetic transfer.

The future vision is aimed at lunar explorations: it would be very useful to start with a considerably reduced weight and then recharge on the way.

Roadmap


Launch of the cluster in LEO orbit
Higher orbit applications
Lunar & Interplanetary missions servicing

Key Partners:
-Solar arrays companies

Key Activities:
Wireless electric batteries recharging

Key Resources:
-Solar Energy

Value Proposition:
-Savings on: development, production, launch and maintenance of solar arrays based on satellites.

Customer Relationships:
Intermediary role between our partners and our customers

Channels:
-Events
-Networking

Customer segments:
-Space launch companies

Cost Structure:

Revenue Streams:

Team

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