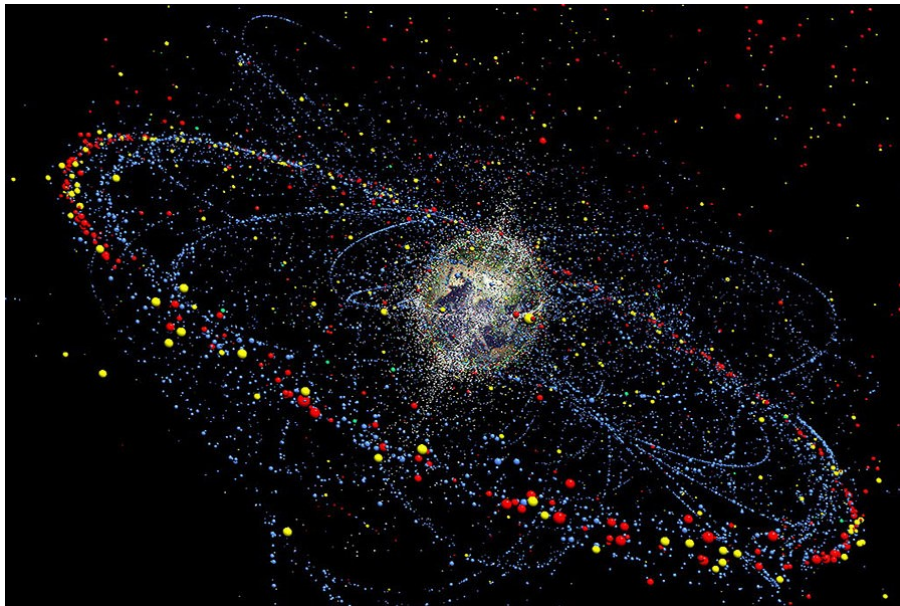


# Space Debris Remediation (SDR) Active Debris Removal (ADR)

## XR-SDR Mission



As a direct consequence of human activities in Space, a huge amount of debris has accumulated on Earth orbits. While this issue was completely underestimated in early Space programs, it has appeared over the years to be a very serious issue. It is now considered by all Space Agencies as the priority one issue to be solved and fixed before any later Space development.

It is not only a big issue in the long run but also in the very short years to come and already represents the main threat for the current population of satellites and therefore for current communications and else. It is by itself both one of the main space safety issue and one of the main current space challenge.

[By clicking here you will be redirected to a UNOOSA page with some information to download](#)

[Click here to be directed to the page of the RAND disclosed report:"Confronting Debris in Space"](#)

Dr. Kessler from NASA, 15 years ago, published some remarks and calculations that predicted that not only the situation will become of course worse but would moreover

worsen and worsen still. Those ideas, now known as the Kessler Syndrome, were not taken very seriously at first but by the time they are now considered as meaningful.

[Click here to be directed to the Wikipedia information about Kessler's Syndrome](#)

**We do not trust in De-Orbiting solutions because, the risk is more important than the solution proposed.**

In addition even if the out of service satellites are placed at cemetery orbit 36086 km, 300km above to GEO, then what? The cemetery will represent an additional potential very high risk for functional satellites and also for the Space Industry in general for manned or unmanned missions.

**It would be a dangerous cloud for space industries!!broken!!**

An other sometimes proposed solution: if the satellite is equipped with final motor embarked for re-entry, the proposed solution is not to burn the satellite in the Earth atmosphere, but only that they be placed at cemetery orbit, for us, this is not a solution to increase each five years the number of invalid satellites to the spatial graveyard, the risk would be increased with exponential progression, we would have then to do with a much worsen KESSLER syndrome.

**These facts are scientifically demonstrated by experts.**

*How to do with a graveyard full of satellites in 20 years, who will anyway decay, come back again at GEO and that will collide with others satellites and also would represent a dramatic danger for the Space Industry.*

At GlycanSpaceXR we not only consider this issue as priority one but we also have got both a proper strategy and we propose adapted technology. In order to capture the debris or retired satellites and antennas, several methods have been proposed to agencies but none is scientifically acceptable without high risk for the cloud of existing or secret satellites and for the Planet. Nets, harpoons, arrows or kinetics tools with ropes while still sometimes considered as a potential solution have been understood to be mainly irrelevant.

Only JPL ( NASA ) has recently (2017!) with the help of Stanford Engineers developed proper tools(grippers) tested in approx ZERO-G in order to capture the space debris or unused satellites with "gecko like micro surface technology". This is a proper tool, that complemented with GlycanSpaceXR technologies can do the job in NEO-LEO-DEEP SPACE.

Several methods in order to remove(de-orbiting) the satellites have been studied without taken in consideration that these satellites were not responding to communications

from the “rescue” engine set by the Earth, and the rescue engine have to do the job without any help from the target(space debris or antenna or satellite body). Because electric power is not operative and Robotics cannot serve on the retired satellites.

It’s time to first limit the launching of micro sat or cube sat. Regarding the increasing risk for the Kessler’s syndrome we consider this business opportunity as unappropriated for the moment and a very risky choice. First of all the real highly risky issue of SPACE DEBRIS is to be fixed before this commercial plan for communications at local Earth.

We place in the same unappropriated way the idea to create space Clouds in order to create BIG DATA security storage around the Earth.,in order to save data from Agencies, Governments industries, banking and Research matters... For the moment it would much too insecure. At scientific level, some points are to be resolved seriously, mainly the risk of insecure communications between several satellites and the risk of satellites being hacked. Quantum communication is a serious candidate for this that we consider in our mission XR-QM (Quantum Machines).

The issue of decoherence will be resolved in a couple of years. Therefore we will pursue the missions of GlycanSpaceXR in order to secure our outer space and the Space Industry. Serious Agencies do not trust seriously in de-Orbiting technologies and its future, because , this represents only a good idea at first glance while the remedies will be worse than the problem to be solved, and will anyway much worsen the issue to a later date. In addition kinetics are not in favor of de-orbiting strategies, because the antennas or retired satellite is not UNDER CONTROL from Earth, and cannot himself readjust geodesic points required. The spatial tool “rescue” who will conduct to orbital grave has to mobilize some Newtons (kinetic energy) to do the job, and the rescue tool must have the installed power to do the job at multi levels. The option to burn the debris or retired satellites or satellite with malfunctions, with re-entry Earth’s atmosphere is amateur decision and risky at contamination level and has not adopted by serious agencies as well, neither NASA-JPL nor DARPA nor DoD nor ESA.

In addition, at present no technologies are prepared in order to terminate and recycle the debris in raw materials without any risk for Earth contamination if de-orbiting *failure when the process is engaged and orbital graveyard is perturbed by others dynamic objects. We propose that the debris be ultimately be reused by the Space Industries after having been transformed in pure metals waiting a future smelting (TERMINATORR HELLIOTORR PERT ) technologies GlycanSpace XR technologies , in order to elaborate other large structures in space, mainly to move to Moon, first stage of second life. Extraterrestrial business plans in order to capture and transport raw materials from NEO-LEO-GEO-GTO localization back to earth is out of our Future capabilities for this specific issue.*

De-orbiting represents a serious source of risks related to de-orbiting and reentry uncertainties, especially for large objects, linked to destruction or failure of robots. This includes high risk Earth contamination. The refining of valuable resources must be installed near the debris and disseminated clouds (HELIOTROPE-PERT TERMINATOR TH3

STATION POWERED BY PLASMA MOTORS ). The resources will be stocked as concentrated metals (PERT) and then pull to the Moon or Mars in secure conditions. SPACE DEBRIS are considered as raw materials for Future Extraterrestrial Activities.

Between 2016 and 2026 it will be necessary to have financial efforts of approx 20BN\$ spread over 10 years in order to realize several missions included the present one. The TERMINATOR RStation will have the role to process debris while the HELIOTORR PERT Station will process to their refining.

### PERT-TERMINATORR TH3 processing HELIOTORR STATION

Part of the Technology :

- Plasma machines (linear-toroidal) MHD-MFD-MGD
- Accretion spheres recovery for atomic species
- Mass – e/m –
- Electrostatic
- Electromagnetic (para HÓ and dial HÒ )
- Resonance ions

### OUR UNIQUE ENGINEERING AND MANUFACTURING POINTS

PERT JPL report (Plasma for Extraterrestrial Resource and applied technologies) has introduced in the early 80s the necessary technology for TERMINATORR and HELIOTORR stations. It has been complemented by PATENTS 2006 CH-WIPO- and Patent PENDING US -2016. By Christian Daniel ASSOUN (Expertise PhD Physics-Atomic spectroscopy 1979 Former Adviser NASA-JPL 1981-1982 ).

PERT REPORT has been USED IN THE JPL NASA report of Director Wolfgang H STEURER-1981-82-83-86 Extraterrestrial Materials processing. The plasma technologies (introduced by PERT report) seems to be the most promising technology to be applied to SPACE DEBRIS REMEDIATION SDR-ADR and /or for Extraterrestrial Mining and Refining.

This plasma technology already exists and several laboratories are working at international level in specialized domains for EARTH application ONLY. GlycanSpaceXR has developed the technology in order to create specific tools for Extraterrestrial Applications.

More than theoretical field the plasma technologies are mostly utilized with “scientific and technological “know-how” collateral from patents and spin-offs of these patents. THE PERT REPORT has set up several bases for ENERGY-MHD-MGD Magnetochemistry-SOLAR-AND NUCLEAR RESOURCES SECURED IN DEEP SPACE.

The goal OF GlycanSpaceXR HELIOTORR is to manufacture the GRAND DUCHY OF LUXEMBOURG and USA (California or FLORIDA KSC) serials OF HELIOTORR PERT STATION and install there its subsidiary companies, in order that they be launched and assembled in Space.

THE PROOF OF CONCEPT (POC) will be launched at LEO 500 km and at GEO 36'000 km(if possible) with 130 kg payload experiment reduced scale 1/30em- or checked at ZERO G orbital flight.

Our strategy with HELIOTORR PERT - POC (proof of concept) is to verify at LEO 500 km and GEO 36'000 km the capabilities of this plasma technology that will be first checked at simulation LABS on Earth with "DEBRIS" of GEO-Chemistry similar in contents / NASA JPL/ EXPERTISE IN THIS ALLOYS CHEMISTRY FIELD.

We estimate at several hundred MUS\$ ECONOMY OF FUNDS AND WE WILL SAVE AT MINIMUM 5 YEARS OF TIME IN THE PROJECT AND IMMEDIATE INVESTMENT IN PLASMA MHD MOTORS (60 MUS\$) IN ORDER TO PROPULSE THE FIRST HELIOTORR PERT. Joint Venture could be signed with Astra Rocket USA, or purchased from GlycanSpaceXR. If not, the plasma motors will be constructed in USA by GlycanSpaceXR.

#### OUR TARGET :

#### SPACE DEBRIS REMEDIATION AT NEO-LEO-GTO

-More than 21'000 to 500'000 potential dangerous debris

#### COST OF OPERATION :

10\$BN-20\$BN spread over 5-7 years

#### ROBOTIC HELIOTORR PERT- TERMINATORR STATIONS TH3

-JOINT VENTURES WITH LAUNCHERS COMPANIES AND OWNERS OF SATELLITES

-SERVICING  
-PREVENTION  
-IDENTIFICATION

#### DESTRUCTION and TERMINATION OF SPACE DEBRIS

Transformation in raw materials(alloys of metals) smelting or pure metals by REFINING in order that they be used in future Space Missions.

## TECHNOLOGICAL POSITIONING OF PERT-TERMINATORR-TH3

### ACHIEVEMENTS OR KEY PARTNERS

AT PRESENT 2016 THERE IS NO DEMONSTRATED ACTOR DECLARED OR KNOWN IN EXTRATERRESTRIAL DEBRIS REMEDIATION Field POSSESSING THE IDEAL TECHNOLOGY.

WE POSSESS THE SOLELY TECHNOLOGY.

WE NEED TO CHECK THE CAPABILITY WITH EXPERIMENT( POC) Proof of concept- PAYLOAD 100 kg-130 Kg LOCATED at Geo OR NEO-LEO-GTO.- or at ZERO-GRAVITY condition (low cost).

WE WILL QUOTE – OFFERS AND SELL OUR HELIOTORR PERT TERMINATORR TH3 STATION “PRODUCTS” IN SEVERAL MONTHS. Possible JOINT VENTURES WITH COMPANIES INVOLVED IN EXTRATERRESTRIAL MINING OR SPACE DEBRIS REMEDIATION.

WE WILL RENT A FACILITY IN LUXEMBOURG and USA California or Florida in order to install the Laboratory of Simulants PERT HELIOTORR STATION and Robotics plan and for SPACE DEBRIS REMEDIATION - Proof Of Concept. We will create a subsidiary in Grand Duchy of Luxembourg – Glycan Space XR-HELIOTORR

WE ALREADY OPENED OFFICE IN PASADENA 91101 , CA USA :

Glycan Space XR HELIOTORR LLC

Glycan Industries LLC

American Institute for Quantum Science and Plasma Technologies, Non-Profit Org

American Institute for NEUROSCIENCES and Plasma Pharmacy, Non-Profit Org

### MASSIVE COST REDUCTIONS

Because of the adopted strategy to check the POC Proof Of Concept with 100 kg-130 kg payload at the SIMULATION LAB in USA and the launch of the POC at LEO at 500 km or at GEO 36'000 km or ZERO-G conditions

### MASSIVE TIME RESOURCES SAVINGS

5 to 7 Years

INCREASED MARGIN BY

Approx 300%-600 %

Price of the preliminary project HELIORTORR-PERT TERMINATORR TH3

30 MUS\$-POC Proof Of Concept

SELLING HARDWARE & SOFTWARE PLATFORM FOR HELIOTORR- PERT  
TERMINATORR TH3 STATIONS

STRATEGIC ONTRACTS WITH AGENCIES MANAGEMENT

JOINT VENTURES

LICENSE TO MANUFACTURE and USE HELIOTORR PERT TERMINATORR  
TH3 Stations, LICENSE granted to strategic partners

FINANCIAL PROJECTIONS:  
REVENUES & PROFITS  
2016-2026

IMPORTANT NOTICE :

This section must be understood as a draft and short notice to be included in the FINAL executive summary.

Several uncertainties are associated to this draft- the Heliotorr Pert station is assimilated to a space craft equipped with important industrial tools embarked, in and out, to be deployed AT LEO-NEO-GTO. This vision of the project seems to be in good agreement with the deep space conditions. We hope to offer the Heliotorr PERT station TERMINATORR TH3 -under the possible following FINANCIAL conditions and arrangements.

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FINANCIAL QUOTE FOR THE HELIOTORR-PERT TERMINATORR TH3  
STATIONS:

230-270 MUS\$

The SPACE DEBRIS are gathered TO 5'000 to 10'000 Tons

We can consider these metals or alloys as precious and strategic destined to be processes as raw materials for other stations to be elaborated in space. Over five to ten years for cleaning around the EARTH.

#### FINANCIAL PROJECTIONS:

In agreement with AVERAGE PRICE 250 MUS\$.

For the Heliotorr-PERT Stations different concepts of funds raising are available:

- INTERNATIONAL DONATION/INVESTMENTS...
- PRIVATE INDUSTRIAL CONTRACT JOINT VENTURE 30%(?) down-payment
- INSTITUTIONAL CONTRACT with governmental Agencies!!br0ken!!

EACH HELIOTORR PERT STATION COULD TREAT TONS OF DEBRIS

ROI (Return on Investment) in our case 3 to 5(coefficient) FOR EACH HELIOTORR  
PERT STATION TERMINATORR TH 3.

[At present the funding is organized by securitization means 2017](#)

### IPO

Extraterrestrial Mining and Refining adventure (IF SPACE DEBRIS REMEDIATION ACTIVE and ENGAGED) constitute one of major challenge for human technologies in front of the deep space and solar system. This crusade in the solar system hunting asteroids in different belts will give force and knowledge to all the actors of this important mission in order to colonize our solar system.

Therefore we strongly believe that the GlycanSpaceXR missions included others, must be treated by a different way.

IPO formed by several companies could federate their efforts in order to create a POOL of actors including Institutional (Gov) in order to create a group of companies, banks or assimilated, capable to introduce on financial markets and set up the CONSORTIUM for Extraterrestrial Mining and Refining (CEMR) on the international public market but with limited shares in order to give to the consortium the legitimate conduct of the project always in the hands of the CEMR. The IPO could produce necessary funds in order to reimburse rapidly the investors, included Gov, Institutions or companies and raise funds for



the whole projects, with comfortable ROI for all the actors, it will be a unique International kinetics!!

## DO NOT KILL ISS !

ISS INTERNATIONAL SPACE STATION for a SECOND LIFE after 2026.

ISS cost has been paid by US at 90% with infusion during years for 90 \$BN.

We propose to refurbish and transform the ISS station in HELIOTORR Station and refund the investors during 20 years, with the funds obtained from SERVICING and CLEANING UP the LEO-NEO-Deep Space, near the Moon, and other missions.

The whole community of launchers, owners of satellites and organization will pay part of the job to be done mainly of cleaning and transformation of the space debris, wastes and Deep Space researches-including GlycanSpaceXR missions.

The Station could be equipped with some plasma motors (some of them with dense species plasma) therefore the STATION will be powered by fuel cells, ionic propulsion, hybrid, solar energy and others...including MHD-MFD-MGD.