

Space Elevators are the Green Road to Space



Space Elevators: The Green Road to Space

Editor: Jerry Eddy, Ph.D.

Peter Swan, Ph.D.
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A Primer for Progress
in Space Elevator
Development

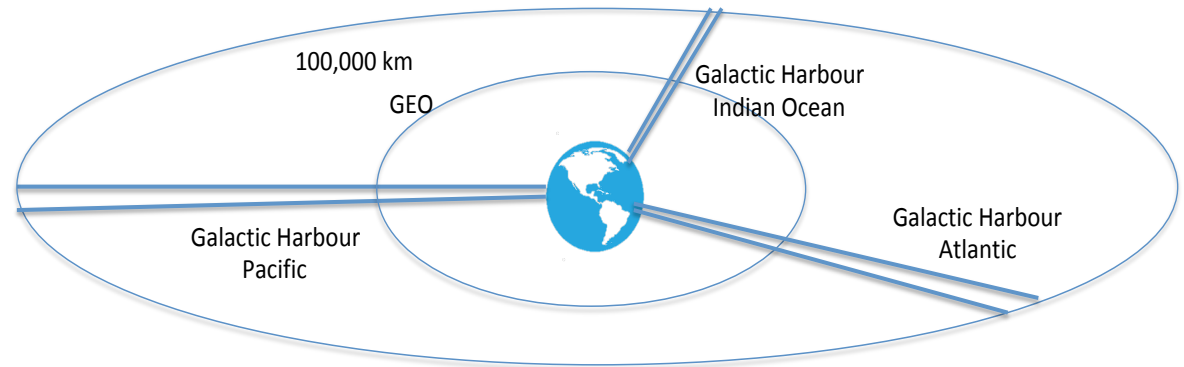
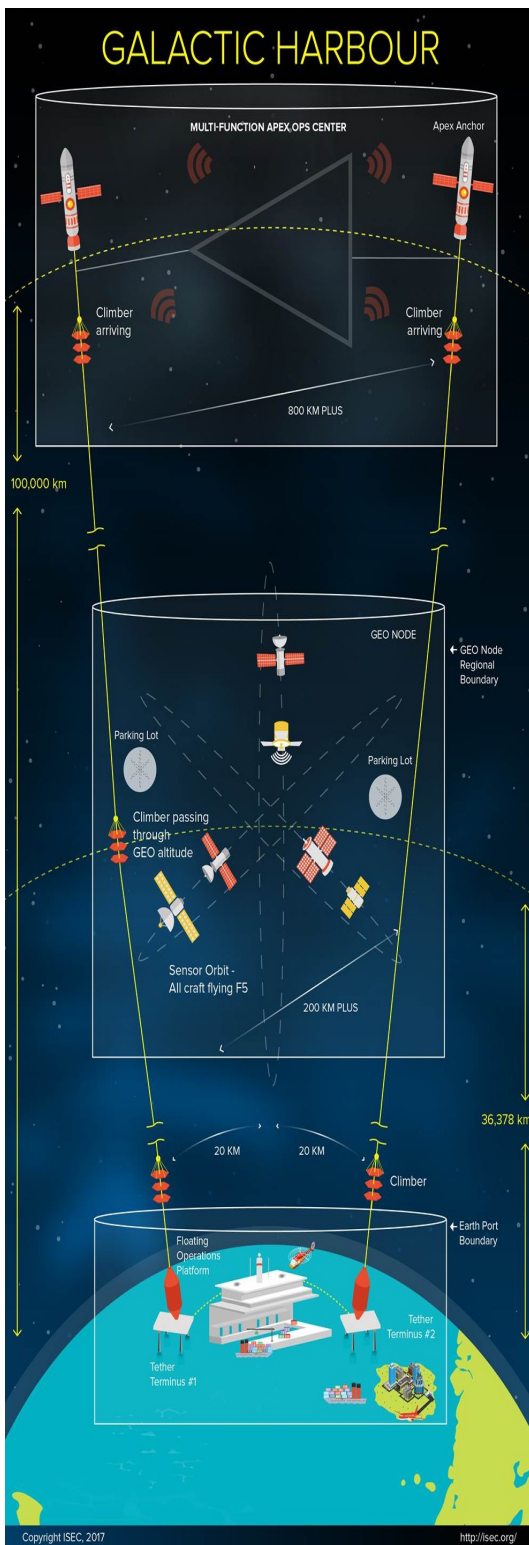


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Pete's Vision of Galactic Harbours

A Green Road to Space



Massive tonnage raised by electricity to GEO and beyond, daily, routinely, inexpensively, safely, and in an Earth Friendly manner.

Three Galactic Harbours – Two Space Elevators each

Initially: 7 Climbers a week/SE – 14 MT each tether climber payload $\times 2 \times 3 = 30,660$ Tonnes/yr

Growing to: 7 Climbers a week/SE – 79 MT each tether climber payload $\times 2 \times 3 = 173,010$ Tonnes/yr

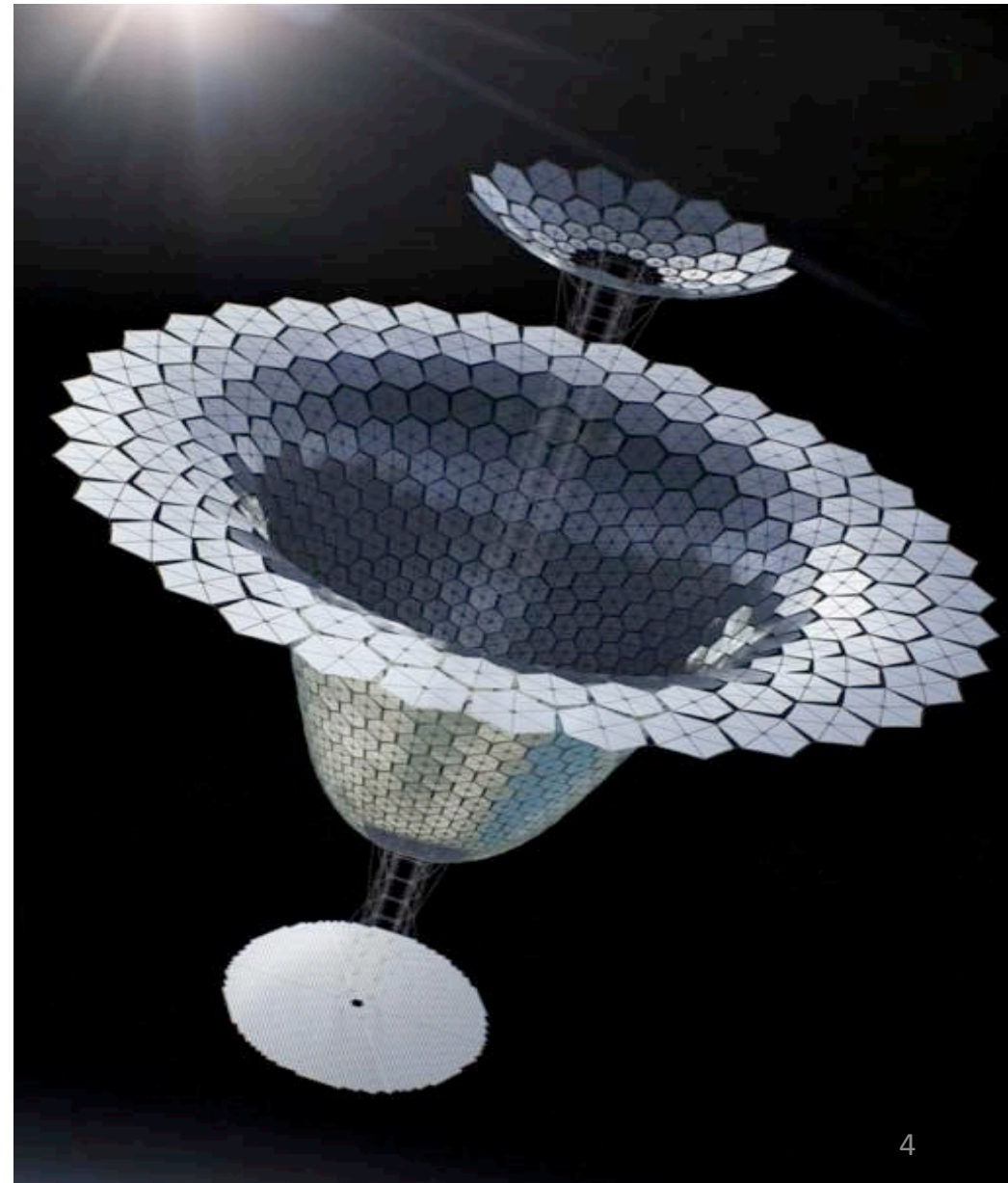
Space Solar Power



Alpha Mark IIIA

9,800 Tonnes

Out Put 2 GWatts



World Total of HLNW By 2050

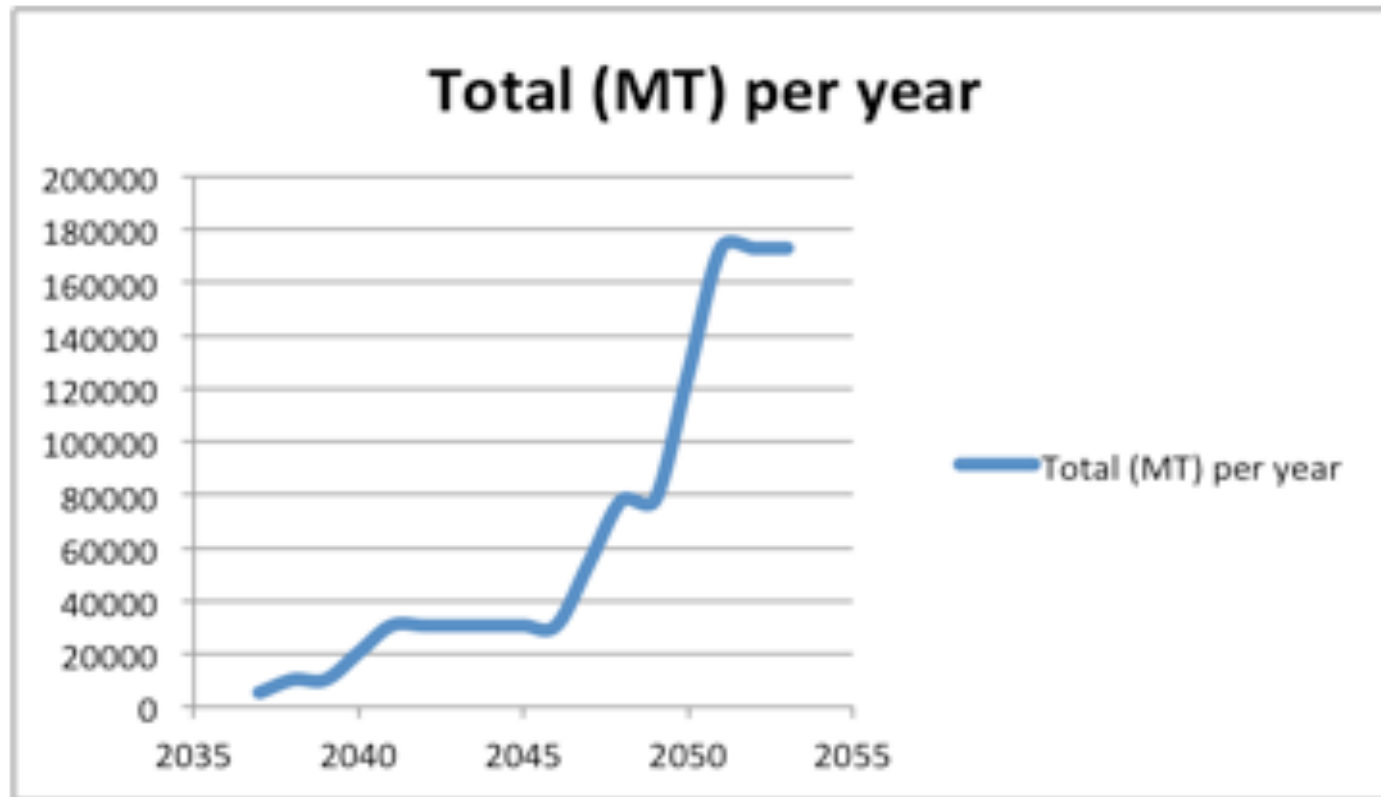


Table 4.2, World Total of H-LNW

Type of Highly Radioactive Material	Storage Method	'World' Total Amount, (Kt)	Planned 'Future' for the Material
Weapons	Dry	315	Permanent Disposal
'Vitrified'*	Dry	36.5	Permanent Disposal
'Repackaged'	Dry	145	Permanent Disposal
'Spent-Fuel'	'Wet'	190	Unknown
Future 2019 - 30		32.8	Permanent Disposal
Future 2031 - 50		90	Permanent Disposal
Total		810,000 tonnes	

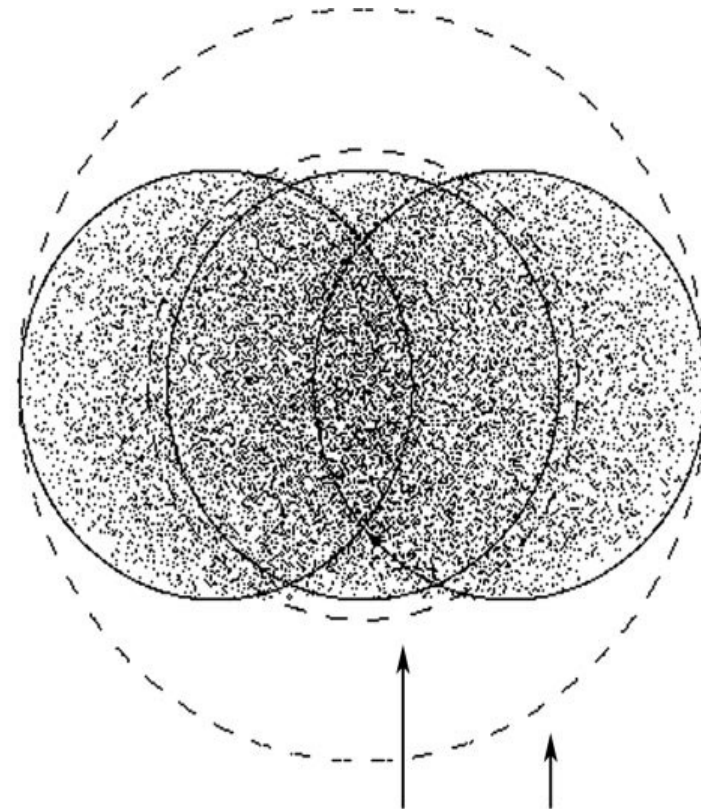
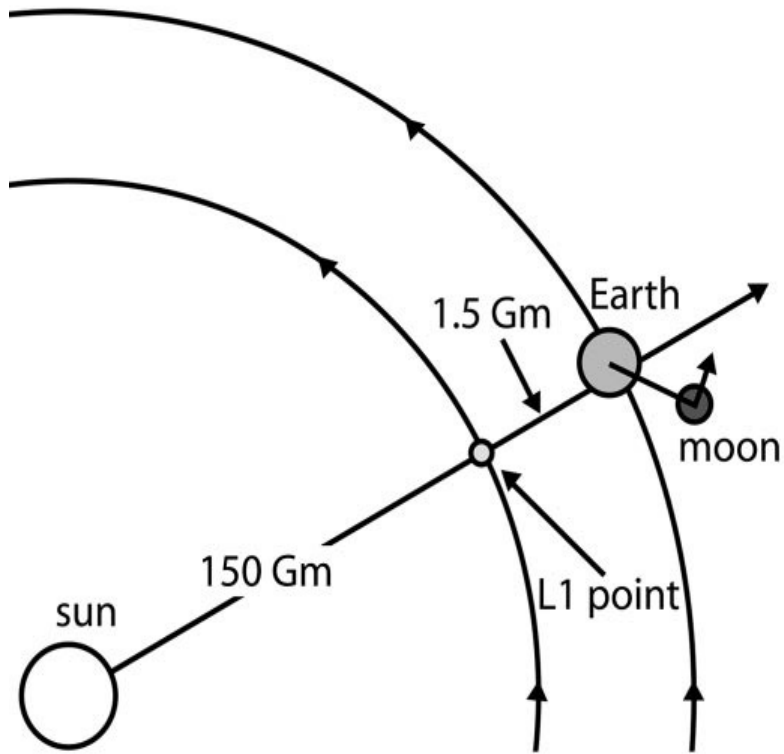
This leads to a total disposal need for H-L-W of close to 810,000 tonnes.

Massive Movement



Space Elevator expected
movement of mass

Sun Shades at L1



Penumbras from 1.5 and 2.4 Gm

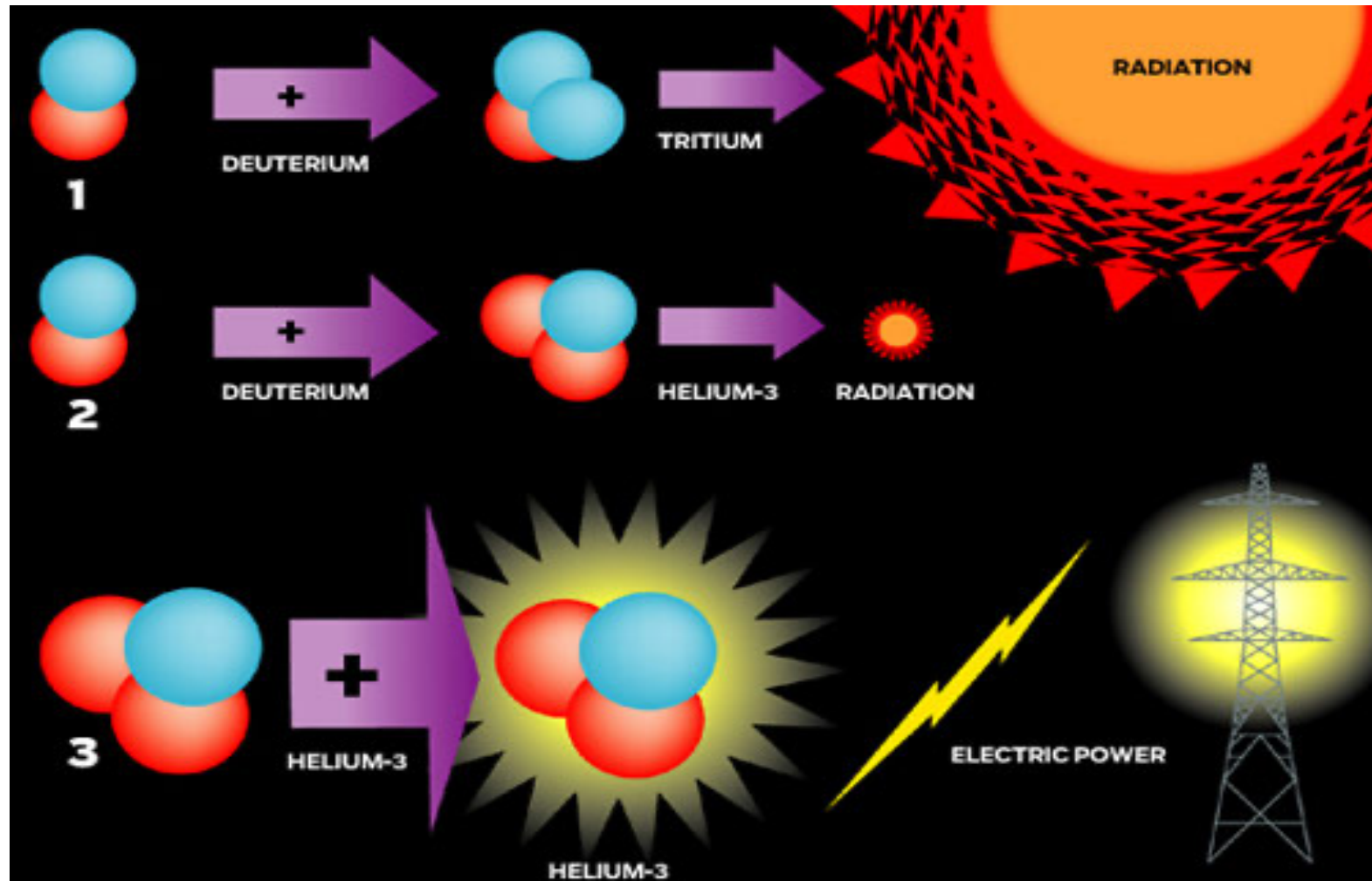
Sun Shades Launches to Complete



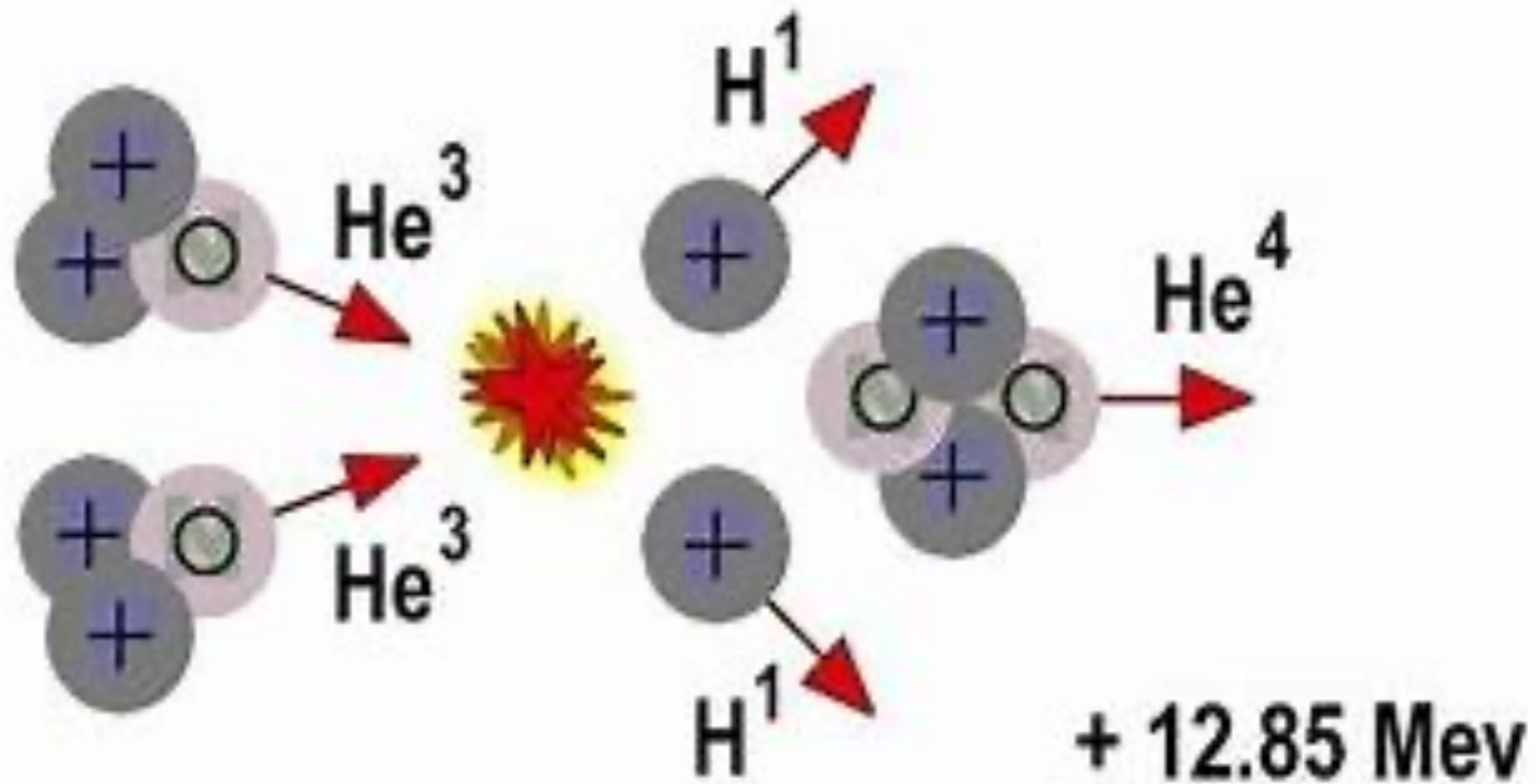
Reference Mission Sun Shade - 20,000,000 tonnes	Saturn V Rocket	Galactic Harbour Initial Operational Capability (2039)	Galactic Harbour Full Operational Capability (2045)	Galactic Harbour Robust Operational Capability (2052)
Throw Mass to L-1	45 tonnes	14 x 6 = 84 tonnes per day	79 x 6 = 474 tonnes per day	79 x 60 = 4740 tonnes per day
Launches Required	444,444	238,100	42,194	4,219
With Daily launches - How many years	1,218	652	115	11.5

Table 5.1 Galactic Harbour Fulfillment of L-1 Sun Shade Missions

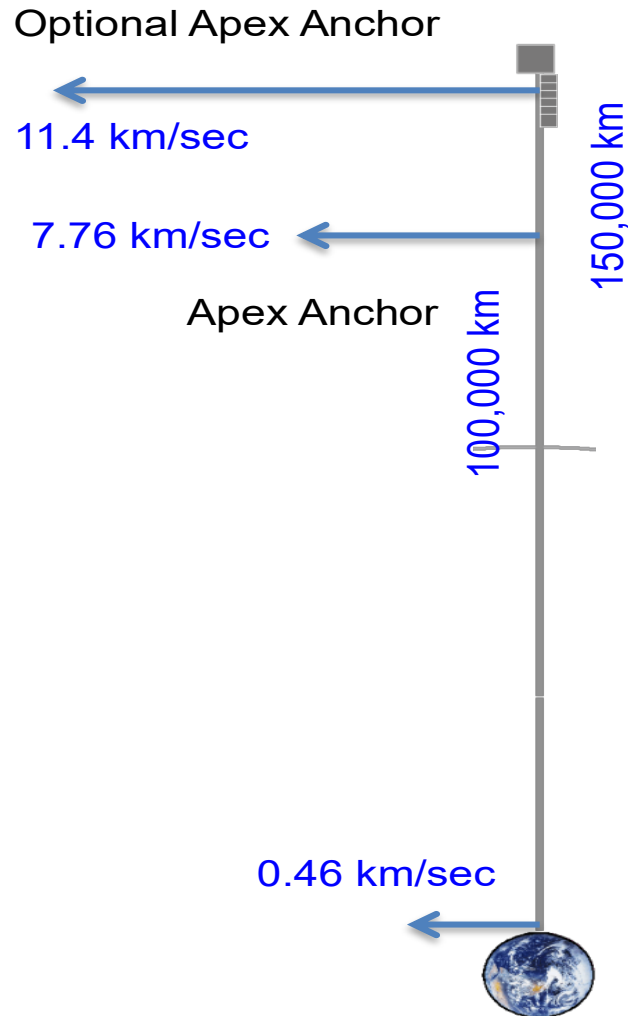
Possible fusion Reactions



He-3 + He-3



Velocities at Apex Anchor



Space Elevator Earth Port



Figure 6.2: Space Elevator Earth Port [Image by lux Virtual and Galactic Harbour Associates, Inc]

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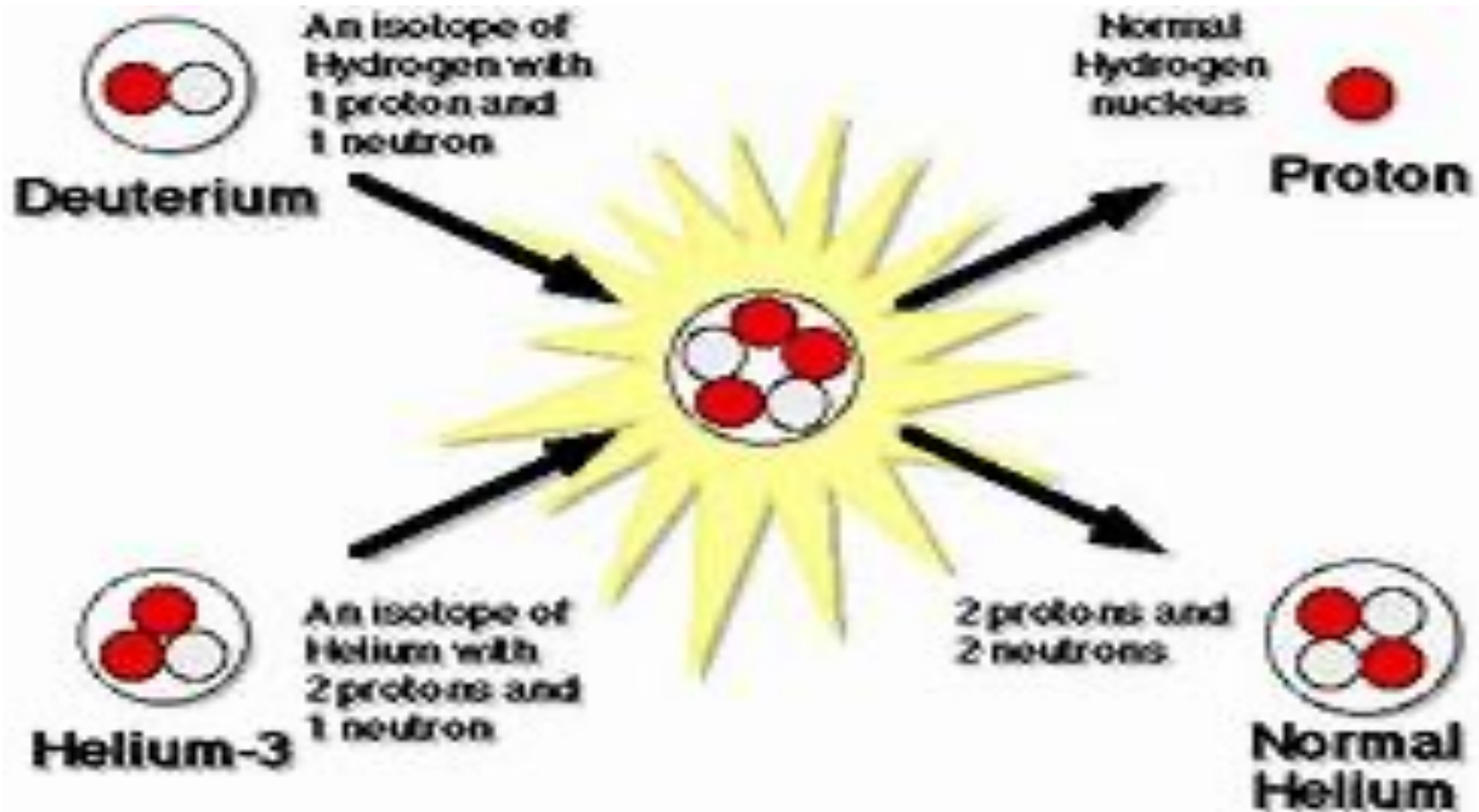
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Wrong Physics?



He-3 on the Moon

