Helios Launch Vehicle
Datasheet

APHELION

Payload

- Standard 12U Cubesat deployer (planned future growth to 24U)

- Spacecraft can be powered on throughout the mission. Data and power are provided through pins located on the bottom of the deployment mechanism.

- Special nanosatellites can be accommodated with a modified payload adapter

End-to-end solution

Helios offers full integration with our Cassiopeia line of modular Cubesat components and software products. We provide consultation, engineering, and launch services to offer turnkey space access solutions even to companies with no prior experience in the space industry.

Responsive launch

Multiple vehicles are kept in stock to minimize turnaround. By building small, we can expect a much higher launch rate than existing vehicles. The standardized deployer allows hop-on, ticket like manifestation, and streamlined vehicle operations allow us to launch multiple times per week if necessary.

Reusability + Volume production

After launch and separation from the upper stage(s), the first stage is recovered for re-use. The first and second stage components can be produced in large quantities, taking advantage of manufacturing economy of scale. The use of both COTS industrial equipment and innovative production techniques allow us to keep costs low while maximizing system reliability and reproducibility.

Stage 3

-High mass fraction, spin stabilized carbon overwrapped solid rocket motor

Stage 2

-Tank and engine design evolved from the Trailblazer sounding rocket

- Proprietary high density nontoxic hypergolic propellant

- Extensive use of composite materials

Stage 1

- 45kN hypergolic aerospike engine with differential thrust vector control (57kN for high energy missions)

- High pressure, pump-fed, reusable propulsion system evolved from 6X Trailblazer combustors

Autonomous FTS

A low cost autonomous flight termination system using redundant GPS/IMU sensors reduces range requirements and operational costs, a necessary element for responsive nanolaunchers.

Avionics

Controller and telemetry system are based on Aphelion's previous work in guidance and control units, providing proven reliability.

Nanolauncher.

Helios offers dedicated flight opportunities to CubeSat class spacecraft which have growing requirements for mission flexibility as their capabilities and mission scope increase.

▸ Our extremely fast turnover rate and low cost is enable by mass produced components and a streamlined production process
▸ Helios allows access to new orbits and the use of special/hazardous payloads, enabling missions that were previously impossible
▸ Missions can be tailored to customer specifications for every launch
▸ Fly what you need, when you need: no wait time incurred by ride-share or SmallSat launchers

We will launch Helios regularly to allow airline-like launch manifestation and to provide reliable ROI on customer missions. Our advantage over SmallSat launch vehicles is clear: having a launch scheduled just for you gives you all the advantage of owning the primary payload at a fraction of the cost of our competitors. By request, we can deliver the nanosatellite into polar and highly eccentric orbits, or interplanetary trajectories.

The Helios vehicle is derived from technology developed on the Trailblazer rocket, which includes our proprietary high-density propellant combination, heritage composite tanks, and a low cost, highly reliable engine architecture. Our unique approach to vehicle design allow us to employ standard manufacturing processes that have been proven in the automotive and aerospace industries.

Total vehicle mass	3510kg
Height	10.3m
Diameter	0.80m
First Stage	45 kN, proprietary hypergolic mixture
Second Stage	9.5 kN, proprietary hypergolic mixture
Third Stage	Optional solid stage
Payload to 400km LEO	20kg
Projected cost per launch*	$750,000

Launch cost includes:

- Client consultation

- Integration and mission management services

-Ground support infrastructure for customer use at launch site

-Launch certification and legal costs