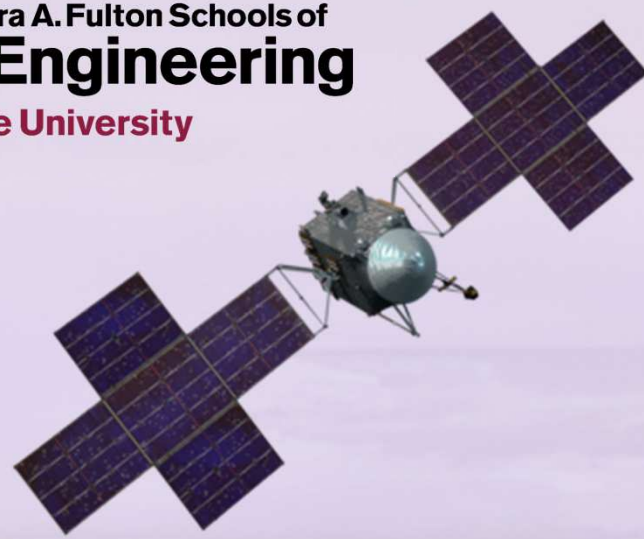




16 – Psyche Economized Power Solution

for Asteroid Exploration



Sponsor: NASA Psyche Mission

Team 19 - 03D Members: Shaun Ludwig, Justin Salinas, Giuseppe Preziosi, Konrad Johnson, Nicholas White

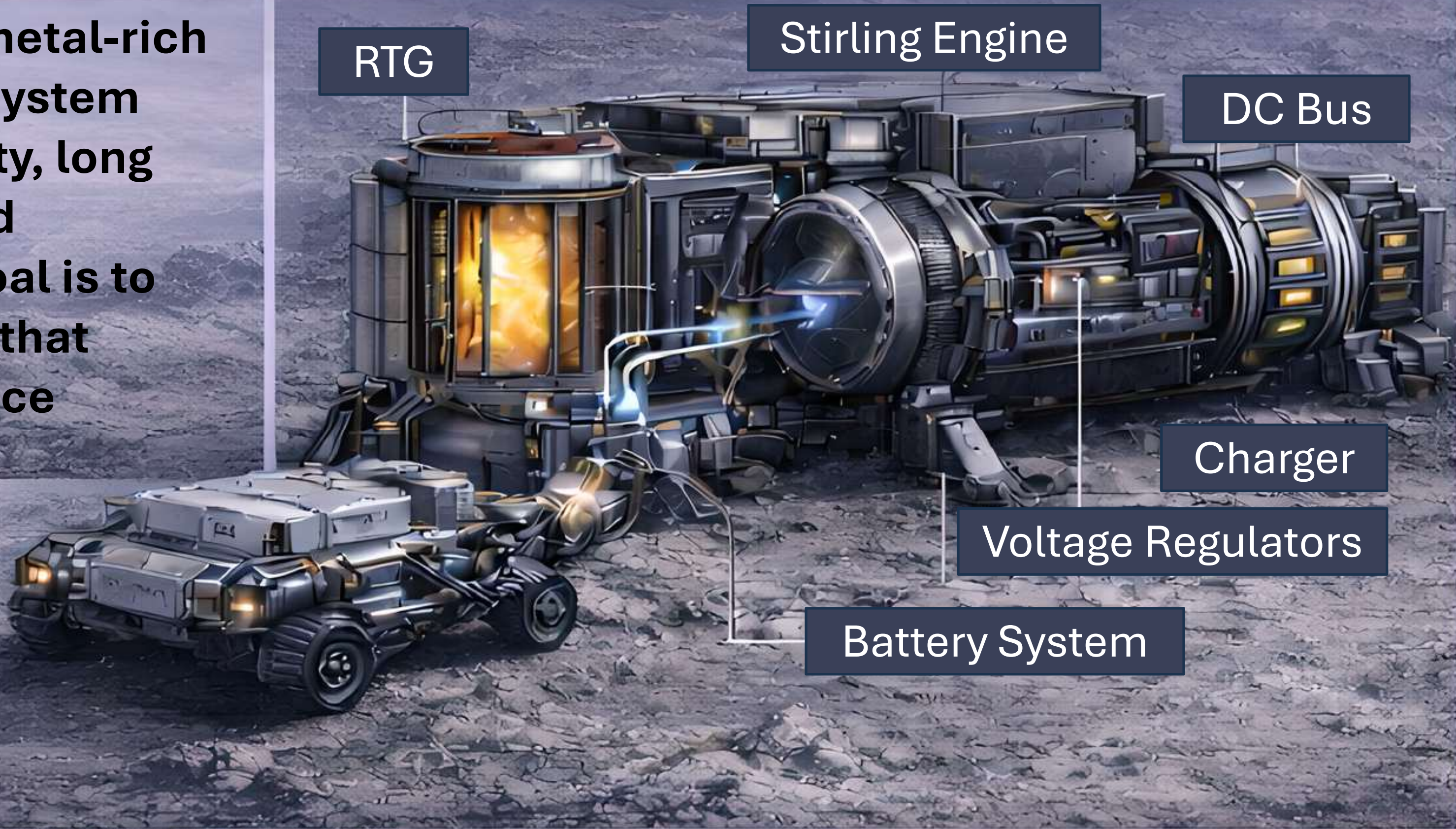
Mission Problem Statement

A future surface mission to the metal-rich asteroid Psyche needs a power system that can operate under low gravity, long days, extreme temperatures, and uncertain terrain. The mission goal is to design a reliable power solution that enables sustained surface science operations.

Power Budget

RTG Electric	70 W
Stirling	70 W
Total Available	140 W

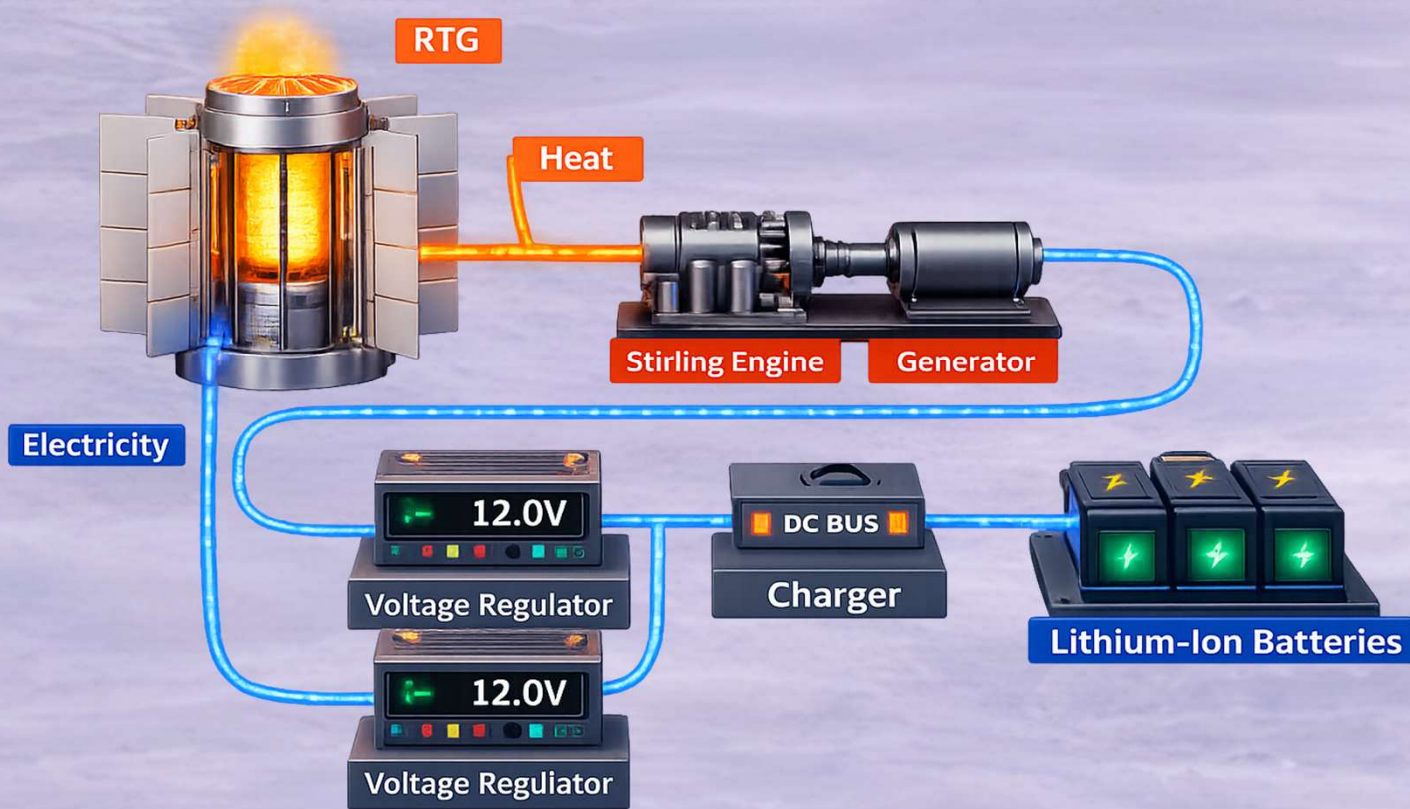
Conceptual Future Space Application



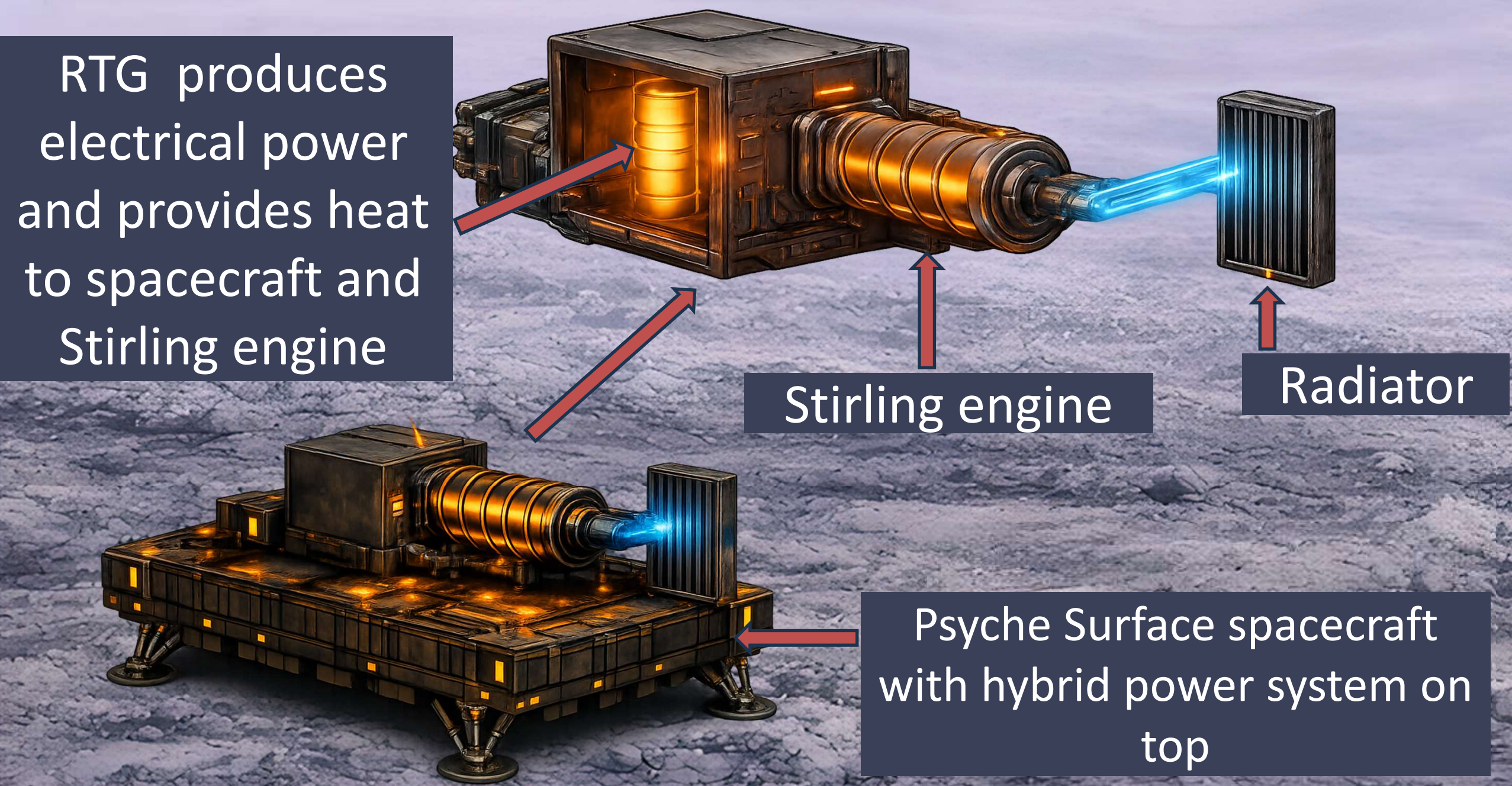
Theoretical Design vs. Actual

	Theoretical	Prototype
Heat Source	RTG	Induction heater
Operating Temp	1273 K	922 K
Ambient Temp	145 K	300 K
Stirling Power	70 W	10 W
RTG Power	70 W	N/A

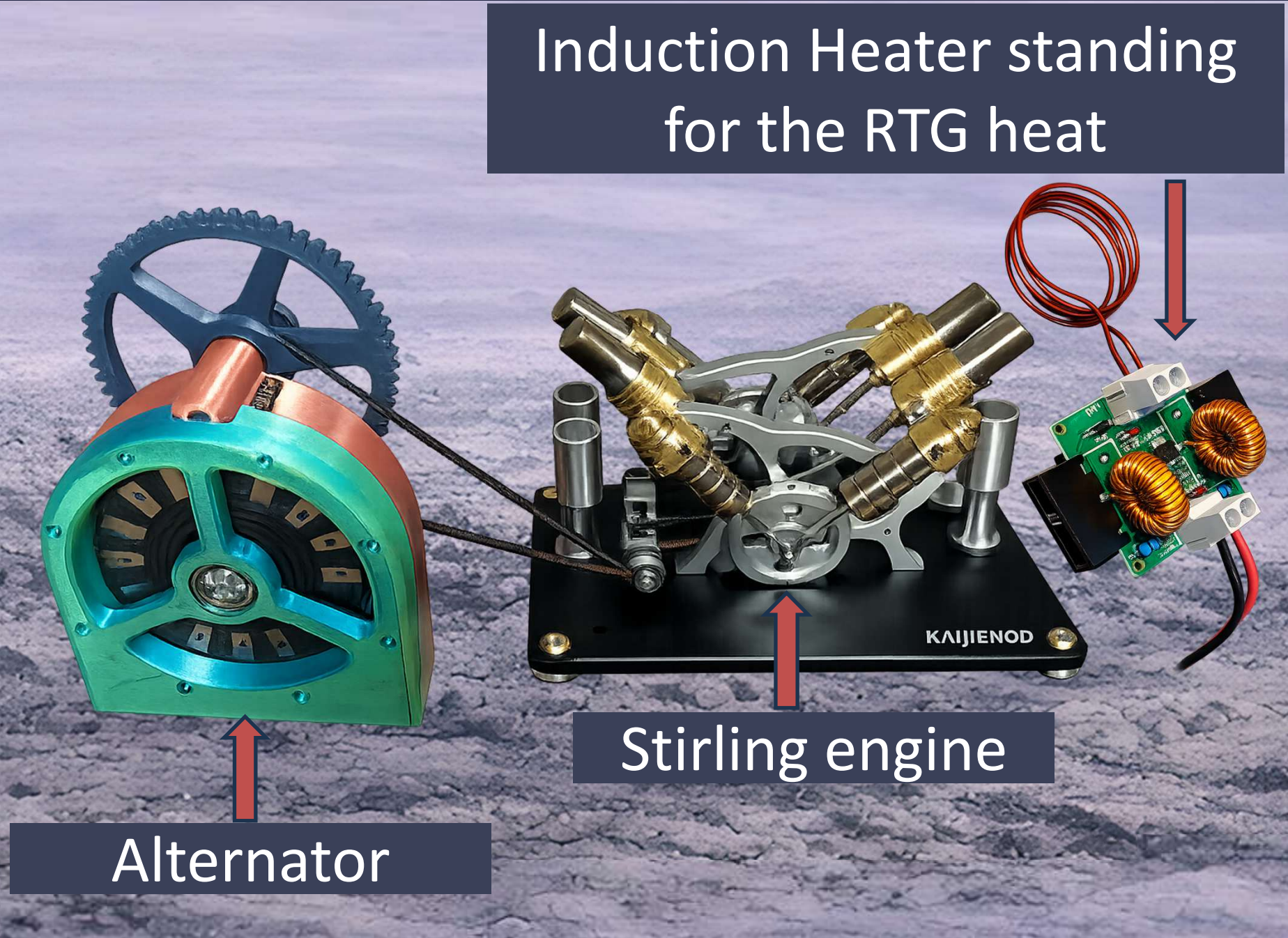
Theoretical Design Layout



Theoretical Design Renderings



Prototype



Mission Challenges

- Low Solar Irradiance
- Extreme Temperatures
- Continuous Power Required

System Advantages

- Continuous Power (RTG + Stirling)
- Improved Efficiency
- Transient Load Handling
- Waste Heat Recover
- Long Lifecycle (10+ years)