

# White Paper: Supra Space Battery™

## Dual-Mode Cryogenic Energy Storage and Field System for Space Applications

### Background

Energy storage in space environments is challenged by extreme temperature variations, limited heat dissipation, and high demands for weight efficiency. Supra Space Battery™ (SSB) is a cryogenic-compatible, dual-mode energy system designed to operate efficiently under such constraints, while offering secondary functionality as a magnetic or shielding field generator.

### Technology Overview

SSB integrates two coordinated subsystems:

1. **Primary electrochemical core** designed for low-temperature superconductivity and high energy density
2. **Auxiliary containment layers** composed of piezoelectric and thermoelectric materials, serving both as environmental shielding and supplementary energy harvesting system

The battery operates at cryogenic temperatures, exploiting naturally cold environments (e.g., space shadow zones or lunar night) to maintain superconductivity and minimize internal resistance. The piezoelectric layer functions as a flexible buffer and emergency discharge matrix, while the thermoelectric segment contributes minor continuous power generation from temperature gradients.

### Key Features

- **Superconductive discharge potential** at ultra-low energy loss
- **Dual unit design:** allows for redundancy and energy routing for field generation
- **Integrated piezoelectric response layer:** physical protection and transient energy storage
- **Internal cooling compatibility:** with structural cavities designed for insulation and shock dispersion

### Potential Applications

- Power supply for satellites, probes, and lunar/Martian infrastructure
- Magnetic shielding systems
- Deep-space propulsion field generators
- Energy storage during extended eclipse cycles or inactive mission phases

## **Intellectual Property**

The system is **patent pending**. It combines known superconductive and electrochemical principles into a novel dual-mode configuration not previously implemented in aerospace energy storage. The material layering and thermal exploitation principles constitute the core differentiating factors.

## **Collaboration Scope**

Parsec Leap Technologies AB invites collaboration within:

- Cryogenic materials testing and optimization
- Vacuum-compatible battery behavior analysis
- Modeling of magnetic field generation under load
- Evaluation of piezoelectric buffering in dynamic environments

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