



Propelling Progress: Solaris Propulsion Outreach

Be a part of the Future. Be a part of Solaris Propulsion!

Background

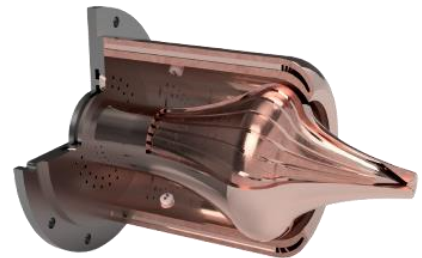
The Solaris Propulsion team at Embry-Riddle Aeronautical University is a capstone team part of the Mountain Spirit Program, a cutting-edge program focused on advancing aerospace technologies. Our mission is to develop the propulsion system for the next-generation of rockets that will push the boundaries of altitude and efficiency in rocket launches. The Mountain Spirit Program aims to surpass the Kármán line, reaching heights of 330,000 feet, a milestone significantly higher than any previous undergraduate liquid rocket program.

The Problem

Current rocket engines face the challenge of inconsistent efficiency across different altitudes, resulting in reduced performance during the critical phases of ascent. Traditional bell nozzles struggle to maintain high efficiency, especially at higher altitudes where atmospheric pressure drops. This limitation prevents the engines from delivering maximum performance and can restrict the potential of high-altitude launches.

The Solution

Solaris Propulsion is developing a liquid bi-propellant aerospike engine. Unlike traditional engines, an aerospike nozzle maintains optimal expansion of exhaust gases over a broad range of altitudes, increasing both efficiency and thrust. By doing so, we are ensuring that our engine performs effectively from the launch pad to the upper reaches of the atmosphere.



Key advantages of our aerospike engine include:

- **Enhanced specific impulse:** By optimizing the expansion ratio of exhaust gases at varying altitudes with the Aerospike Nozzle, the engine will outperform a traditional Bell Nozzle's efficiency.

- **Efficient thermal management:** Our cooling system integrates active, regenerative, and film cooling, ensuring the engine remains within operational temperature limits guaranteeing the engine is reliable and reusable.
- **Reusability:** Designed for reusability, our engine will undergo multiple test firings, reducing costs and increasing sustainability.

How You Can Help

To achieve this ambitious goal, we are seeking partnerships with companies that share our vision of advancing aerospace technology. Your support could provide essential resources in the following areas:

- **Materials and Manufacturing:** High-grade materials for engine components and cutting-edge manufacturing processes like Metal 3D printing and CNC machining.
- **Funding:** Financial sponsorships to support research, development, and testing phases, including procurement of propellants, sensors, and control systems.

By partnering with Solaris Propulsion, you will be investing in the future of aerospace innovation and supporting the next generation of engineers as they push the boundaries of propulsion technology.

How Can We Help

Solaris Propulsion is developing a modular parametric design framework and verification tools for an aerospoke rocket engine. The project will result in the creation of software packages, SolidWorks models, and verification data. If your company wants to develop an aerospoke, Solaris Propulsion could provide a massive head start at a fraction of the cost.