

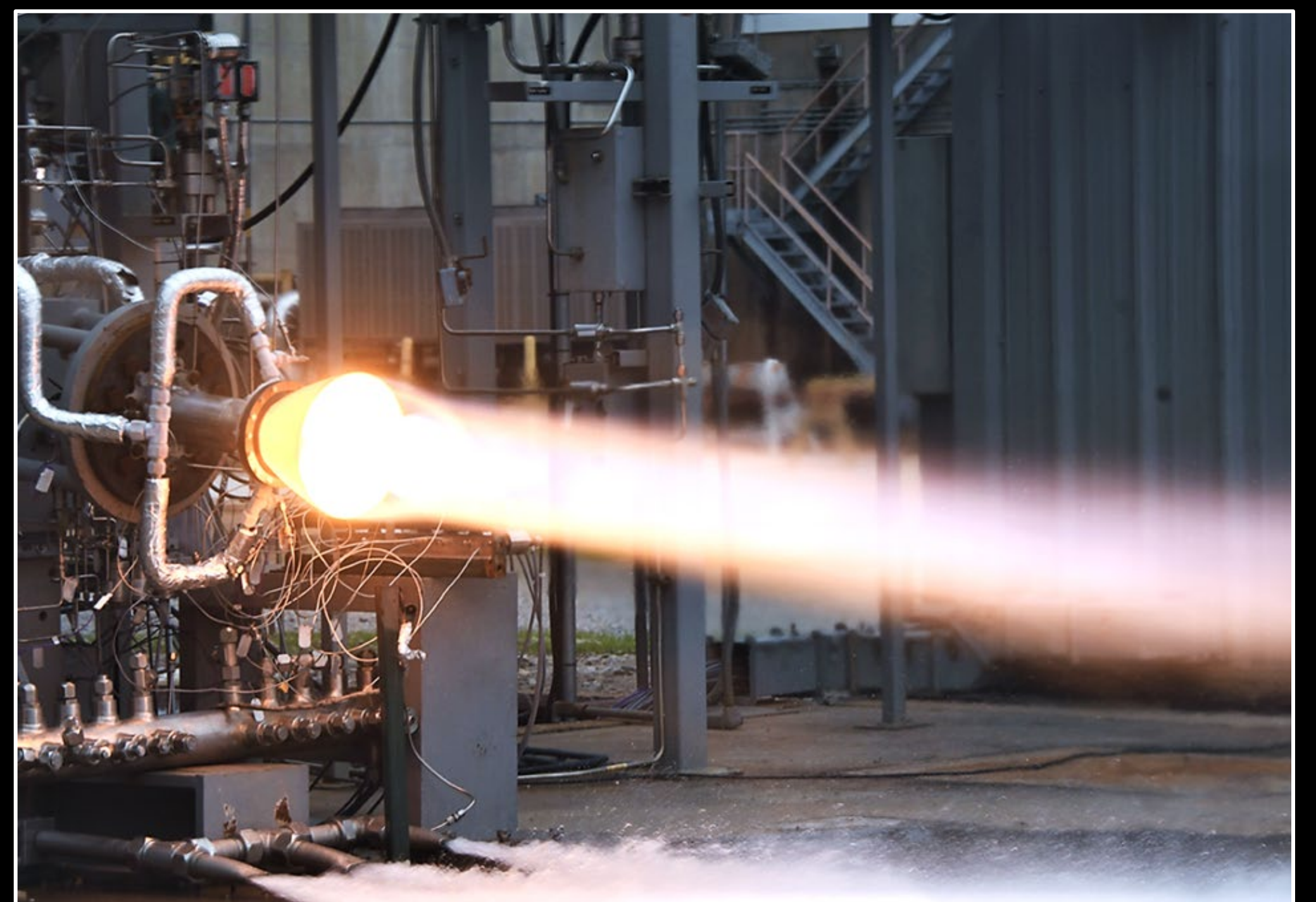
Space Technology Mission Directorate Game Changing Development Program **Robotic Deposition Technology (RDT)**

Project Overview

Aerojet Rocketdyne (AR), in partnership with NASA-MSFC under an ACO, are working to demonstrate the design and manufacturing of an innovative bimetallic and lightweight Thrust Chamber Assembly (TCA) that is cost-efficient, scalable, and capable to increase effectiveness of current and future propulsion options.

Technical Approach

Develop and mature robotic deposition additive manufacturing (AM) processes and materials: Cold Spray Deposition (CSD), Laser Powder Bed Fusion (L-PBF), and Laser Wire Direct Closeout (LWDC) using Superalloys, Aluminum, and Cu Alloys. Phase I was a 7k-lb_f Technology L-PBF/Cold Spray Demonstrator and Phase II is a 7k-lb_f fully additive bimetallic cold spray lander-class thrust TCA.



Hot Fire Test RDT Chamber



Cold Spray
Deposition
Process



Completed
ALPACA
chamber



RDT
Nozzle

Results/ Summary

- Hot fire testing conducted in two phases.
- Phase 1 demonstrated successful firing of RDT chamber.
- Phase 2 to be conducted September 2022 using RDT nozzle.