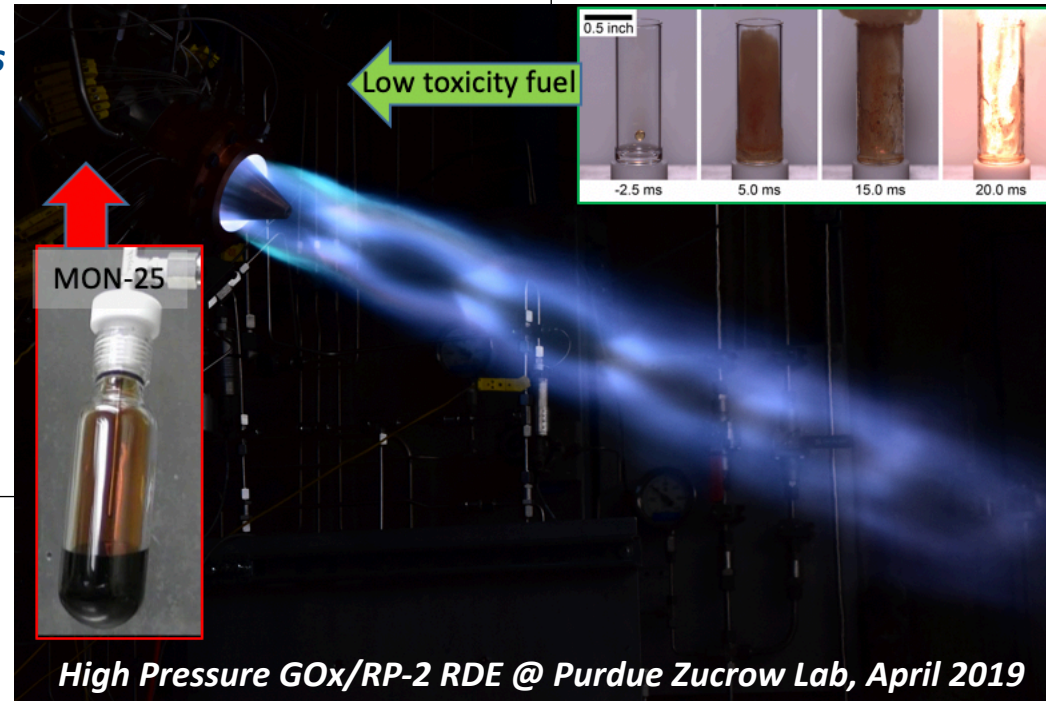


Rotating Detonation Combustion for Space Engines using **Reduced Toxicity Hypergolic Propellants**

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High Pressure GOx/RP-2 RDE @ Purdue Zucrow Lab, April 2019

Research Objectives

- Optimize injector/chamber configurations for high performance
- Select high performance, low toxicity fuel for optimal detonation behavior
- Quantify system level benefits for a variety of missions
- Advance technology from TRL 1 to TRL 3 by demonstrating performance at simulated altitude conditions

Approach/Statement of Work

- Task 1: Experimental Apparatus and Propellant System Design and Fabrication
- Task 2: Combustion Chemistry and Performance Modeling
- Task 3: Sea-level Testing and Design Iterations
- Task 4: Simulated Altitude Testing with Nozzle
- Task 5: System Performance Study
- Task 7: Reporting

Potential Impact

- Higher specific impulse and lower weight space engines for a variety of NASA missions
 - Orbital Maneuvering/Reaction Control Systems
 - Planetary Descent/Ascent
 - Deep Space Exploration
- Reduced operations costs using lower toxicity fuels