

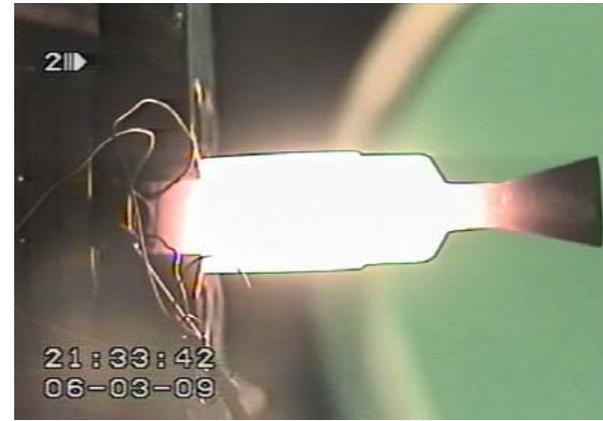


**NASA SBIR/STTR Technologies**  
Non-Toxic HAN Monopropellant Propulsion  
PI: Tim McKechnie/Plasma Processes, Inc.-Huntsville, AL  
**SBIR Proposal No: X2.02-9554**



**Identification and Significance of Innovation**

- Most In Space chemical propulsion systems use hydrazine propellant. Hydrazine is highly toxic & dangerously unstable.
- Non-toxic HydroxylAmmonium Nitrate (HAN) monopropellant has 12% higher Isp than hydrazine monopropellant.
- HAN's combustion temperature is significantly higher at 2083°K.
- Long life *Ir/Re chambers* will enable the use of HAN.
- New *ignition techniques* and *catalysts* are also required for HAN.



Testing of 1N Chamber  
with ADN Monopropellant

**Technical Objectives and Work Plan**

- Design, fabricate and test a long-life, iridium-lined rhenium combustion chamber for HAN monopropellant.
- Evaluate the ignition of HAN using iridium catalytic foams.
- Evaluate the ignition of HAN with a torch igniter.
- Analyze components after testing.
- Propose a thrust chamber for Phase II testing using best ignition technology.

**NASA and Non-NASA Applications**

- Mono-propellant and Bi-propellant rocket engines
- Reaction Control Systems
- Apogee Engines
- Mars Ascent Vehicle, Lunar lander

SBIR Industrial Partners:



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**NON-PROPRIETARY DATA**