



SMALL SATELLITE PROPULSION

Technology Development, Assessment, and Testing

Aerospace has been involved with small satellites for nearly 30 years, beginning with academic research and development modules that carried small cold-gas thrusters for basic maneuverability. Today, propulsion is no longer an optional capability, but is required to enable our customer's specialized missions. Essential maneuvers such as orbit changes and maintenance, attitude control, de-orbit at end of life for orbital debris mitigation and space traffic management, inspection, and formation flying, all require propulsion. Aerospace supports these efforts through internal technology development, technology assessments, and environmental ground testing. We operate a family of chambers specially tailored for small satellite propulsion testing needs that include but are not limited to:

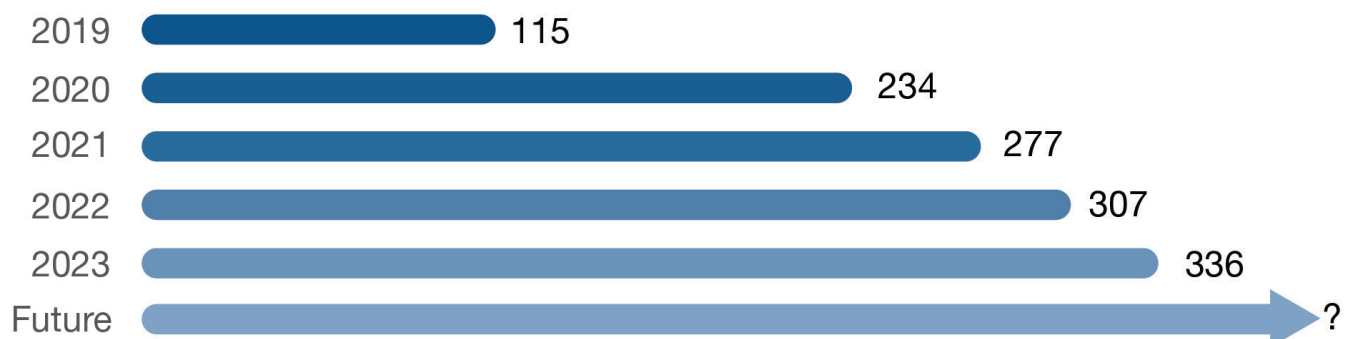
How to Engage

› Physical Sciences Laboratories
PSL@aero.org

Targeted propulsion technologies:

- Spacecraft power: Few kW or less, with emphasis on <1kW
- Spacecraft mass: Hundreds of kg or less

The field of small satellite propulsion is growing fast, fueled by the influence of rapidly emerging startup companies. In just the last 5 years, the field has tripled from around 100 to more than 300 systems. Our role as an FFRDC and our subject matter expertise in both small satellites and propulsion uniquely positions us to track, evaluate, and test these small satellite propulsion systems for the benefit of our customers.



Over the last few years, the number of small satellite propulsion systems continues to rise due to an influx of venture capital into startup companies. To learn more, read about our Small Satellite Propulsion Technologies Compendium at <https://aerospace.org/commercial-showcase>.

Capabilities Legend



Inert Propellants



Hydrazine and Hypergolics Handling



Alternative Propellants Handling



Life Test



High Flow Rate



Large Test Article



Thermal Vacuum



Plume Diagnostics



Launch Simulation (ultra-fast pumping)



Performance Measurements (thrust stand)



Chemical Hot-Fire

The small satellite propulsion family of chamber infrastructure supports a wide breadth of testing capabilities:



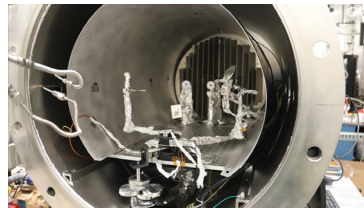
SNAKE PIT

- Large 8' x 14' chamber



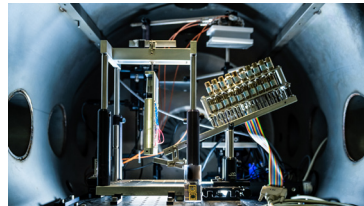
MUD PIE (NEW!)

- Medium 4' x 8' chamber



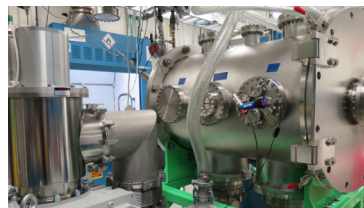
BLUEBERRY PIE

- Small 3' x 5' chamber
- Specialized for field-emission electric propulsion (FEEP)



CHERRY PIE

- Small 3' x 5' chamber



KEYLIME PIE

- Small 3' x 5' chamber



The Aerospace Corporation

The Aerospace Corporation is a leading architect for the nation's space programs, advancing capabilities that outpace threats to the country's national security while nurturing innovative technologies to further a new era of space commercialization and exploration. Aerospace's national workforce of more than 4,600 employees provides objective technical expertise and thought leadership to solve the hardest problems in space and assure mission success for space systems and space vehicles. For more information, visit www.aerospace.org