In-Space Propulsion

First generation EP
Enabling unprecedented Maneuvering for today’s spacecraft

Second generation thrusters
Rapid tech transition via agile Space experiments

Next generation EP technology
High energy density (FRC) and High efficiency (ES) operation

Adv. Monopropellants
Transitioning successor to hydrazine

Next-generation Bipropellants
Extending performance beyond hydrazine / N2O4

 Dump Tank
(175 ft)

 Test Chamber
(50 ft)

Total Volume ~ 45,200 ft³
Technology for Sustainment of Strategic Systems

Modeling & Simulation
Analysis at every stage of lifecycle provides capability to assess performance and reduce acquisition cost

Aging and Surveillance
Non-destructive monitoring of individual assets enables condition-based maintenance and assures capability to meet mission

Missile Propulsion
Design, development, and demonstration of integrated SRM technology provides capability for greater range and throw-weight for strategic missiles

Full-scale technology demonstration
Combustion Devices Research

Modeling & simulation
Reduce engine development & testing cost via physics-based modeling

Develop hydrocarbon fuels for next-gen reusable engines

Combustion Dynamics
Test & develop engine design tools for performance & cost
Troubleshoot tech-demo programs

Fuel line coking

Analysis
Timely accurate assessment of rocket propulsion technology payoffs

Carbon-carbon Composites
World leader in ultra-high temperature composites for rocket propulsion & hypersonic needs

Validation expt
Simulation
Liquid Rocket Engine Technologies

Hydrocarbon Boost
Demonstrating Tech for High Performance Rocket Engines and Redefining World State of the Art

Next Generation Technologies
Modular Rockets Transform Cost Paradigm for Design, Development, and Test

Rapid Tech Transition
Advancing U.S. Tech Base to End Reliance on Russian Booster Engines
Propellant Technology Base

Physics-Based M&S: Streamlined discovery, design, and synthesis of next-gen propellant ingredients

Process Modernization: Utilizing advanced manufacturing to safely produce obsolete, expensive, or difficult materials at reduced cost

Solid Propellant Mixing: Understanding effects of ingredient and process variables in order to optimize propellant formulations

Ionic Liquid Propellants: High-performance, non-toxic liquids for next gen spacecraft applications

Mechanics of Materials: Advanced measurement of propellant mechanical response improves structural analysis and reduces service life prediction uncertainty

Inert Materials Development: Reducing mass to enable improved range, payload, and time-to-target capabilities

Advanced Composite Case Fabrication Technology: Enabling use of high-temp resins for higher mass fraction rocket motors
Rocket Testing Facilities

- High Altitude Facilities
- Solid Rocket Motor Test Stands
- Liquid Rocket Engine Test Stands
- Liquid Component Test Stands
- Lab-scale thru Sub-scale Facilities

Reduced Scale

- Injector Face
- Full Scale $$$
- Midscale SS
- Small scale S