



Space Vehicles Directorate

Located at Kirtland Air Force Base, N.M., the Air Force Research Laboratory Space Vehicles Directorate serves as the Air Force's center of excellence for space technology research and development. The Directorate develops and transitions space technologies to provide space based capabilities to the warfighter.

The Directorate operates on 438,000 square feet of laboratory and office space. It supports over 50 state-of-the-art research laboratories and testing structures at Kirtland as well as a unique high altitude balloon program at Holloman AFB, N.M. Leading the nation in space supremacy, the Directorate consists of an integrated team of 800+ military, civilian, and on-site contractors.

About the Space Vehicles Directorate

The Directorate is organized into divisions by major technology thrusts and support operations. Each area has world-class personnel, equipment, and facilities structured to support the warfighter. The divisions are:

Battlespace Environment Division: Specifies, forecasts, mitigates, and exploits environmental impacts to U.S. space systems and operations. Its main research areas include space weather sensing and modeling; position, navigation and timing technologies; hypertemporal imaging; and space object surveillance.

Integrated Experiments and Evaluation Division: Develops and integrates ground and space experiments designed to assess and prove emerging technologies and concept of operations for military space applications.

Spacecraft Technology Division: Provides affordable, resilient, survivable technology options to the warfighter to enable space supremacy through focused research and discovery. Research and development activities include space electronics, spacecraft components, and space-based sensing.

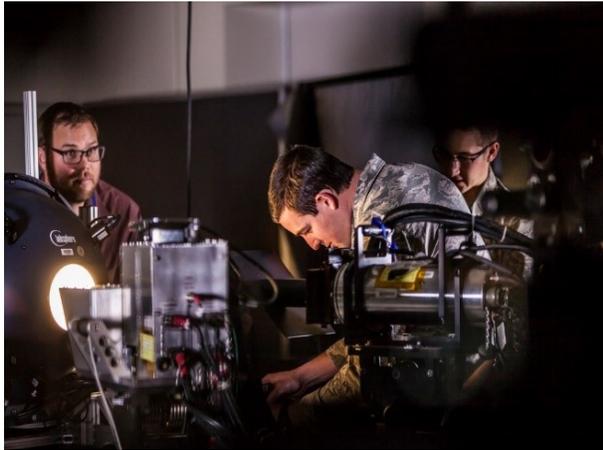


Scientists conduct an experiment in the Space Vehicles Directorate's plasma chemistry lab used to understand how the space environment affects spacecraft in orbit. Photo credit: AFRL Space Vehicles

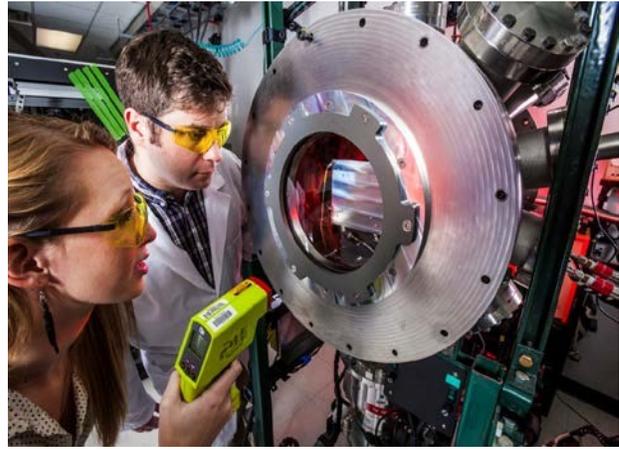
Integration and Operations Division: Directs all human resource, facility, small business portfolio management, and logistics support to the AFRL Directed Energy and Space Vehicles Directorates as well as environmental assessment, strategic and tactical planning, and program management support to the Space Vehicles Directorate.

Corporate Information Division: Provides Information Technology and Services to the AFRL Directed Energy and Space Vehicles Directorates. It also operates and maintains scientific and engineering information technology infrastructure, technical library, historical services, and management information systems.

Contracting Division: Provides contracting support to the AFRL Directed Energy and Space Vehicles Directorates and other agencies. Represents the AFRL in acquisition matters with other government agencies and the scientific and industrial community.



Space Vehicles Directorate researchers finish characterizing calibration equipment used to optimize performance of airborne and space based optical sensors. Photo credit: AFRL Space Vehicles



Space Vehicles Directorate scientists test equipment in the Ultra Violet Test Chamber. AFRL uses the chamber to test a variety of spacecraft materials. Photo credit: AFRL Space Vehicles

Recent Space Vehicles Successes

- Completed the design, build, test, and launch of the EAGLE and Mycroft spacecraft missions. The spacecraft were launched from an Atlas V rocket on Air Force Space Command-11 (AFSPC-11) mission from Cape Canaveral, Florida in April 2018. The successful launch demonstrates lower cost delivery of satellites to orbit, improved space situational awareness for space vehicles, and an innovative approach for getting satellites into space.
- Conceived and designed the Roll-Out Solar Array (ROSA) experiment that was launched on a June 2017 CRS-11 mission to the International Space Station to test unfurling, structural dynamics and refurling of a new solar panel system. The flight experiment achieved 100% of its objectives. ROSA reduces solar array mass by 20% and package volume by 400%.
- Designed and fabricated an amplifier that more than doubled the output power and efficiency of amplifiers used on current GPS satellites. This amplifier can be used to lower the size, weight and power of the current system or provide additional power for future satellite navigation systems.
- Designed and built the Advanced Structurally Embedded Thermal Spreader II flight experiment that uses oscillating heat pipes (OHP). ASETS-II was flown on the X-37B spaceplane launched by a SpaceX Falcon 9 rocket in August 2017. In a 2-year space flight, it will assess OHP performance in microgravity and long-term performance on orbit.
- Developed the third-generation Compact Environmental Anomaly Sensor (CEASE3) to rapidly diagnose space environmental anomalies. This data allows U.S. Air Force satellite operators to rapidly rule-in/rule-out the environment as a cause when diagnosing an anomaly.
- Transitioned ANGELS flight operations to the Air Force Space Command, following a highly successful on-orbit experiment campaign. The 13-month campaign demonstrated and proved advanced space situational awareness capabilities. Transition efforts were conducted in parallel with the experiment campaign culminating in full transition to AFSPC.