



Space Vehicles Directorate

Stay One Step Ahead In Space



About the Space Vehicles Directorate

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

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 Air Force Base, N.M. Leading the nation in space supremacy research and development, the Space Vehicles Directorate consists of an integrated team of 900-plus military, civilian, and on-site contractors.

Technical Mission Areas

There are four mission areas at the center of all research and development in the Directorate. In each area, Space Vehicles has world-class personnel, equipment, and facilities to support the warfighter.

Defensive Space Control

- Evolve space resilience
- Holistic local awareness sensors
- Satellite intelligence technologies
- Passive protection and active agility
- Associated modeling, simulation, assessment, and testing

Space Communications/Positioning, Navigation, and Timing

- Extend frequency tradespace for space communication
- Address projected jamming threats
- Develop technology and create options for future GPS spacecraft

Intelligence, Surveillance, and Reconnaissance (ISR)

- Support Space-Based Infrared System and DoD unique terrestrial weather systems
- Provide capability to warfighters for over-the-horizon and traditional space-based ISR systems
- Provide key nuclear explosion monitoring technology

Space Situational Awareness

- Search, discover, track, and maintain custody of space objects
- Provide space object identification and discrimination
- Understanding and predicting how objects move in space
- Characterize, assess, and resolve anomalies on space systems





The Space Vehicles Directorate is organized into divisions by major technology thrusts and support operations. Often, research capabilities are drawn from more than one division and across AFRL. 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, hyperspectral data exploitation, hyper-temporal 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 advanced sensing.

Integration and Operations Division: Furnishes human resources, facilities, and logistics support to the AFRL Directed Energy and Space Vehicles Directorates as well as environmental, strategic and tactical planning, and program management support to the Space Vehicles Directorate.

Corporate Information Office: 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.

Recent Space Vehicles Successes

- Completed the integration and test of the Automated Navigation and Guidance Experiment for Local Space (ANGELS) satellite, which was successfully launched from an Air Force Space Command rocket in July 2014
- Won the 2014 Federal Laboratory Consortium, Mid-Continent Regional Award for Excellence in Technology Transfer for the development and transition of the Joint Space Operations Center (JSpOC) Mission System, which will replace multiple legacy systems and will allow the JSpOC to better support its numerous customers
- Completed integration, test, and delivery of the GlobalStar Experiment and Risk Reduction Satellite (GEARRS), which was launched from Cape Canaveral on an Atlas 5 rocket in May 2015. GEARRS demonstrates the ability to use commercial communication networks to provide near persistent, real-time command and control for low earth orbit satellites. It also serves as a key risk reduction for future Air Force satellites
- Designed and fabricated the Roll-Out Solar Array (ROSA), a revolutionary new architecture that reduces stowed solar cell volume by 6x, increases deployed panel stiffness by 4x, and reduces mass by 3x. All of these factors improve satellite survivability in space and reduce the cost of launch
- Collaborated with the Intelligence Advanced Research Projects Agency's (IARPA) High Frequency Geolocation program to collect data to characterize the mid-latitude ionosphere. This experiment provides the most complete characterization ever performed of the mid-latitude ionosphere and will be used to help the DoD and Intelligence Community improve tracking and radar systems



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Current as of June 2015
http://www.kirtland.af.mil/afrl_rv/index.asp