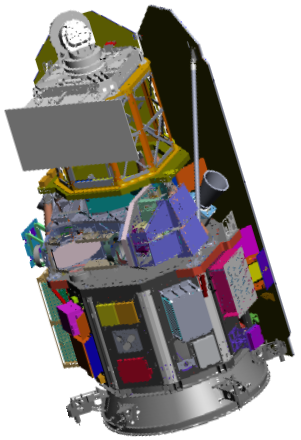
MISSILE DEFENSE AGENCY

https://www.mda.mil
mda.info@mda.mil

5700 18th Street, Bldg 245
Fort Belvoir, VA 22060-5573

Fact Sheet

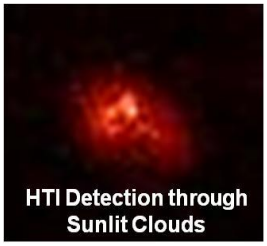
Near Field InfraRed Experiment (NFIRE)



The Near Field Infrared Experiment (NFIRE) technology project was launched from Wallops Island, at 06:49 GMT on 24 April 2007 into a low Earth orbit of 425x425km. NFIRE was operated by the Missile Defense Agency (MDA) from the Missile Defense Integration and Operations Center at Schriever AFB, Colo. until it was decommissioned on 5 August 2015. The satellite was built with a one year mission and a two year goal but greatly exceeded the design by operating for over 8 years. NFIRE successfully completed all of its primary and secondary objectives for which it was designed and contributed to numerous data collection activities for the Department of Defense as a whole, several of which it was not designed to perform.

The prime integrator for the NFIRE satellite was General Dynamics Advanced Information Systems, a business unit of General Dynamics of Fairfax, Virginia. The satellite carried two payloads into a low Earth orbit aboard an Air Force four-stage Minotaur I space launch vehicle, contracted through Orbital Sciences Corporation's Launch Systems Group.

The primary mission of NFIRE was to collect high and low resolution images of a boosting rocket to improve understanding of missile exhaust plume observations and plume-to-rocket body discrimination during three plume signature types: targets of opportunity, dedicated missile fly-bys, and ground observations. This payload, known as the Track Sensor Payload (TSP), was developed by Science Applications International Corporation (SAIC) of San Diego, California under contract to the Air Force Research Laboratory at Kirtland Air Force Base, New Mexico. The Missile Defense Agency used this data to validate and update models and simulations that were fundamental to missile defense intercept technologies. A secondary objective of the experiment was to collect types of infrared and visible light data for assessing early missile launch detection and tracking capability. NFIRE executed numerous missions for environmental background characterization (regional/seasonal atmospheric radiance variability, day-night, land-sea, clouds, auroral measurements, etc.) for future space tracker sensors and the SM-3 IIB seeker development programs. NFIRE also successfully collected hyper-temporal short wave infrared data to support research and development of early launch detection and tracking capabilities. These data collections demonstrated the capability to detect early missile launch through sunlit clouds and supported the improvement of environmental models.



HTI Detection through Sunlit Clouds

Limb Phenomenology

Additionally, NFIRE had a secondary payload, the Laser Communications Terminal (LCT), that supported successful laser communications demonstrations as part of an international cooperative agreement between the United States and Germany. The German government provided the LCT payload for NFIRE and flew a sister spacecraft, TerraSAR-X, with an identical LCT. Together, these two satellites conducted over 950 global space-to-space and space-to-ground communication links as well as numerous experiments to characterize seasonal atmospheric effects on laser communications. Together, NFIRE and TerraSAR-X accomplished the first data transfer between two spacecraft at a rate of 5.6 gigabits per second; the highest data rate for any satellite system at that time.