

## ATLAS V ECHOSTAR XIX MISSION

An Atlas V 431 rocket will deliver EchoStar's XIX satellite to geosynchronous transfer orbit (GTO). The United Launch Alliance (ULA) Atlas V rocket is provided to Lockheed Martin Commercial Launch Services. Liftoff will occur from Space Launch Complex-41 at Cape Canaveral Air Force Station, Florida.

EchoStar XIX will be the world's highest capacity broadband satellite in orbit, dramatically increasing capacity for HughesNet® high-speed satellite Internet service to homes and businesses in North America. This large, multi-spot beam Ka-band satellite, based on the powerful SSL 1300 platform, will be stationed at 97.1 degrees West longitude. Building from their experience on the highly successful EchoStar XVII broadband satellite, SSL and Hughes collaboratively engineered the specific design details of this payload for optimum performance.



Satellite Image Courtesy of EchoStar

### Payload Fairing (PLF)

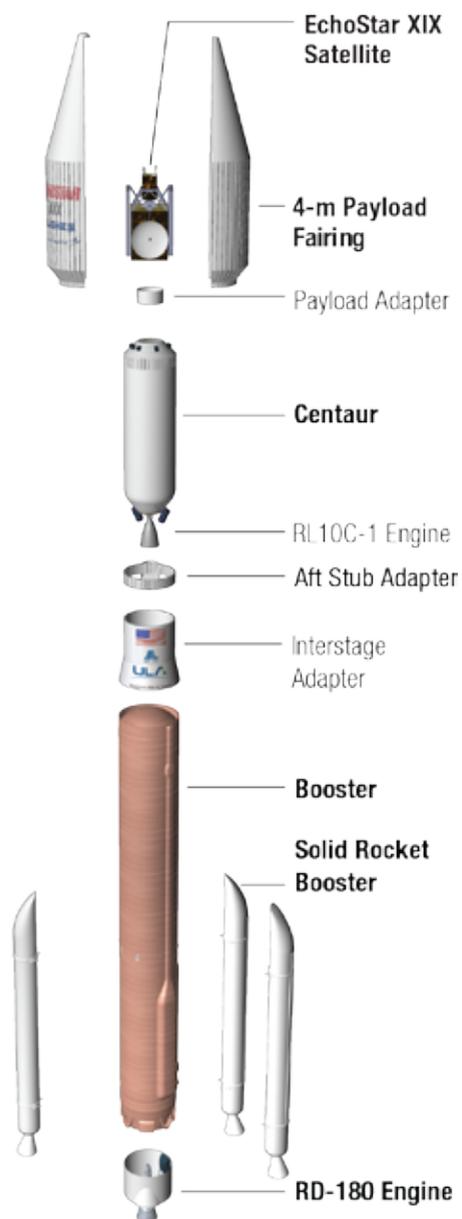
The EchoStar XIX satellite is encapsulated in the 4-m (14-ft) diameter extra extended payload fairing (XEPF). The XEPF is a bisector (two-piece shell) fairing consisting of aluminum skin/stringer construction with vertical split-line longerons. The vehicle's height with the PLF is approximately 194 ft.

### Centaur

The Centaur second stage is 10 ft in diameter and 41.5 ft in length. Its propellant tanks are constructed of pressure-stabilized, corrosion resistant stainless steel. Centaur is a liquid hydrogen/liquid oxygen- (cryogenic-) fueled vehicle. It uses a single RL10C-1 engine producing 22,900 lbf of thrust. The cryogenic tanks are insulated with a combination of helium-purged insulation blankets, radiation shields, and spray-on foam insulation (SOFI). The Centaur forward adapter (CFA) provides the structural mountings for the fault-tolerant avionics system and the structural and electrical interfaces with the spacecraft.

### Booster

The Atlas V booster is 12.5 ft in diameter and 106.5 ft in length. The booster's tanks are structurally rigid and constructed of isogrid aluminum barrels, spun-formed aluminum domes, and intertank skirts. Atlas booster propulsion is provided by the RD-180 engine system (a single engine with two thrust chambers). The RD-180 burns RP-1 (Rocket Propellant-1 or highly purified kerosene) and liquid oxygen, and delivers 860,200 lb of thrust at sea level. Three solid rocket boosters (SRB) generate the additional power required at liftoff, with each SRB providing 348,500 lb of thrust. The Atlas V booster is controlled by the Centaur avionics system, which provides guidance, flight control, and vehicle sequencing functions during the booster and Centaur phases of flight.



## ATLAS V 431

The Atlas V 431 configuration rocket, with three solid rocket boosters, provides the optimum performance to precisely deliver a range of mission types. In service for more than ten years, the Atlas V 431 configuration rocket has launched two commercial communications satellites where they provide global communications from geostationary orbit.

First Launch: Mar. 11, 2005  
 Launches to date: 2

Performance to GTO: 7,700 kg (16,970 lb)  
 Performance to LEO-Reference: 15,260 kg (33,660 lb)



### America's Ride to Space

With more than a century of combined heritage, United Launch Alliance is the nation's most experienced and reliable launch service provider. ULA has successfully delivered more than 110 satellites to orbit that provide critical capabilities for troops in the field, aid meteorologists in tracking severe weather, enable personal device-based GPS navigation and unlock the mysteries of our solar system.

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## MISSION OVERVIEW

- 68<sup>th</sup> Atlas V Launch
- 115<sup>th</sup> ULA Launch



America's Ride to Space

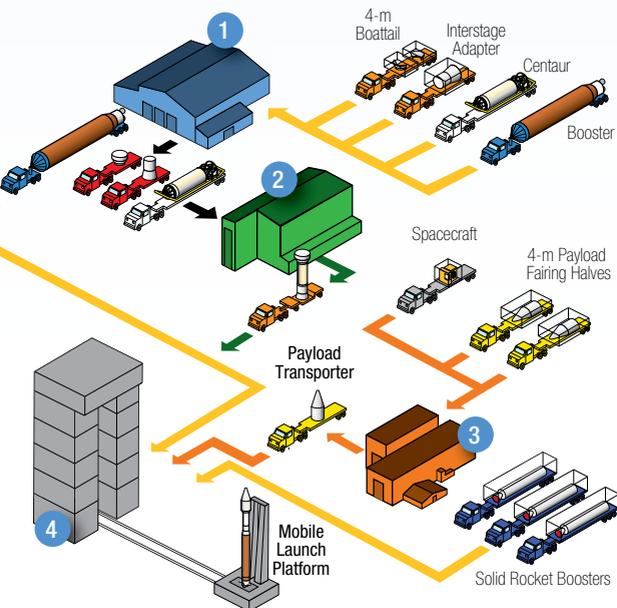
# ATLAS V PRODUCTION AND LAUNCH

- 1 Sacramento, CA**  
– Solid Rocket Booster Fabrication at Aerojet Rocketdyne
- 2 Denver, CO**  
– ULA Headquarters & Design Center Engineering
- 3 Harlingen, TX**  
– Payload Fairing, Payload Fairing Adapter, Booster Adapter & Centaur Adapter Fabrication
- 4 Decatur, AL**  
– Booster Fabrication & Final Assembly, Centaur Tank Fabrication & Centaur Final Assembly
- 5 West Palm Beach, FL**  
– RL10C-1 Engine Fabrication at Aerojet Rocketdyne
- 6 Khimki, Russia**  
– RD-180 Engine Fabrication at



- 1 Atlas Spaceflight Operations Center (ASOC)** | Launch Control Center and Mission Director's Center
- 2 Delta Operations Center** | ISA, Centaur, Boattail Vertical Integration
- 3 Spacecraft Processing Facility** | Spacecraft processing, testing and encapsulation
- 4 Vertical Integration Facility** | Launch vehicle integration and testing, spacecraft mate and integrated operations

- 1 Vertical Integration Facility (VIF)** (See inset)
- 2 Bridge Crane Hammerhead**
- 3 Bridge Crane**
- 4 Launch Vehicle**
- 5 Mobile Launch Platform (MLP)**
- 6 Centaur LO<sub>2</sub> Storage**
- 7 High Pressure Gas Storage**
- 8 Booster LO<sub>2</sub> Storage**
- 9 Pad Equipment Building (PEB)**
- 10 Pad ECS Shelter**



# MISSION PROFILE AND GROUND TRACE

