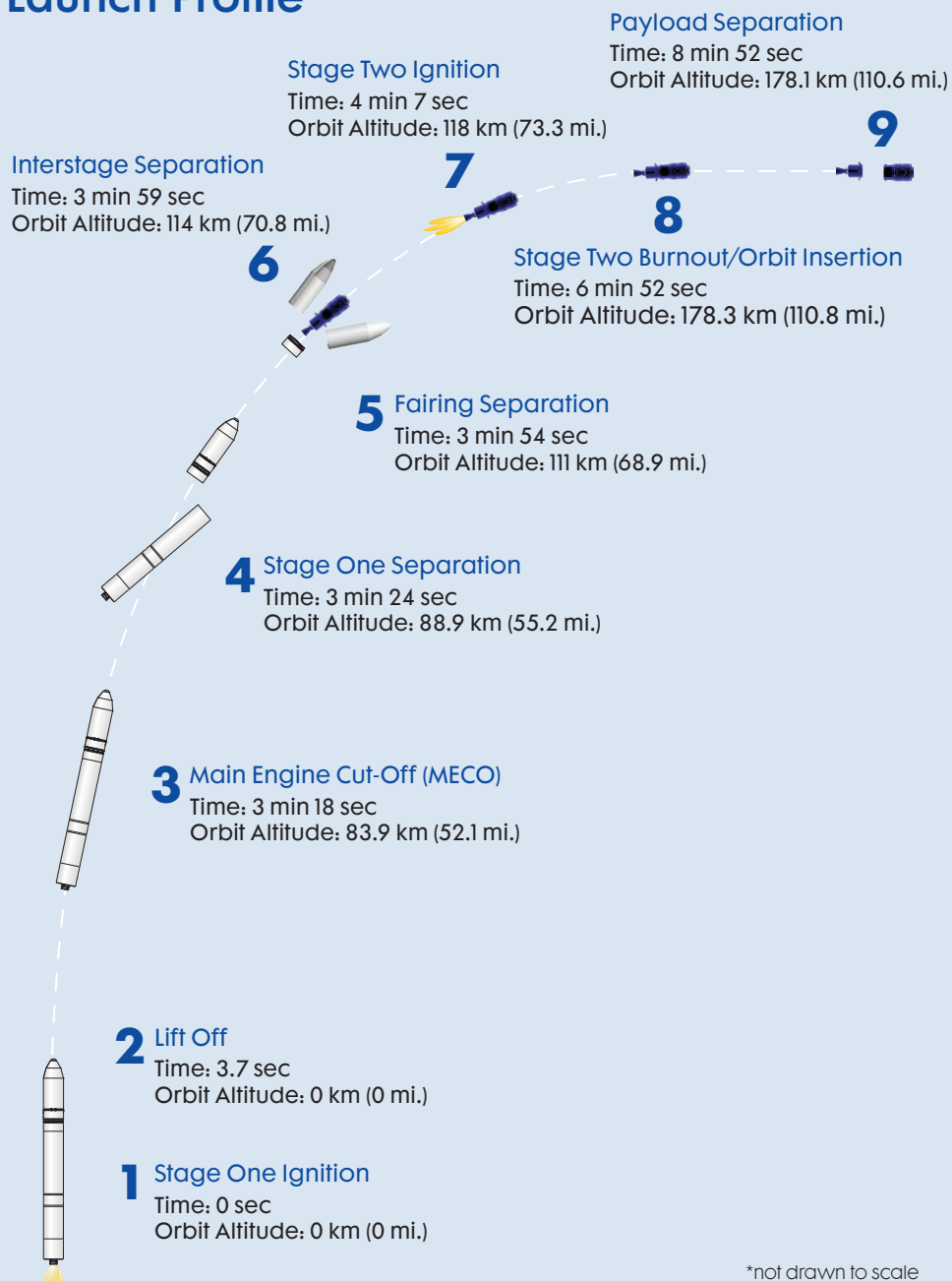


NG-14 Mission

Delivering Cargo to the International Space Station

Launch Profile



Mission Parameters

Launch Vehicle:
Antares 230+

Cargo Spacecraft:
Cygnus

Launch Site:
MARS Pad 0A,
Wallops Island, Virginia

Ascent Cargo Mass:
Approx. 3,400 kg (7,500 lb.)

Descent Cargo Mass:
Up to 3,700 kg (8,100 lb.)

Initial Orbit Altitude:
171 km x 295 km

Inclination:
51.63°

Transit to Station:
Two Days

Duration at Station:
Up to 90 Days Berthed
Up to two weeks on orbit

Mission Description

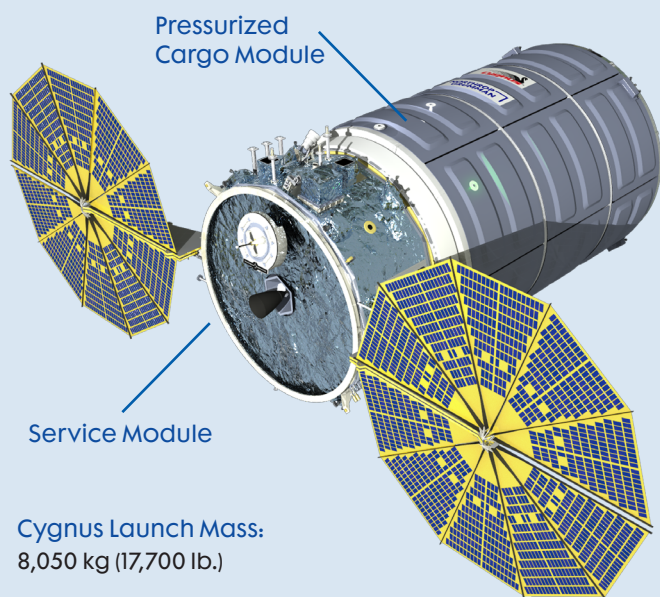
For the NG-14 mission, the Cygnus spacecraft will deliver approximately 3,629 kg (8,000lb.) of cargo to the space station. Cygnus is comprised of two primary components, the Pressurized Cargo Module and the Service Module. In keeping with company tradition, each spacecraft is named after an important figure in the aerospace industry. Northrop Grumman is honored to name the NG-14 Cygnus spacecraft after the first woman of Indian descent to fly in space, Kalpana Chawla. The S.S. Kalpana Chawla will be launched into orbit using an Antares 230+ rocket

from Virginia Space's Mid-Atlantic Regional Spaceport (MARS) Pad OA on Wallops Island, Virginia. Northrop Grumman will once again load critical cargo into Cygnus, 24 hours before the scheduled launch.

Upon arrival at the International Space Station, the cargo will be unloaded from Cygnus. For the fifth time, Cygnus will host the Spacecraft Fire Experiment -V (Saffire-V) experiment to study the behavior of large-scale fires in microgravity that will be performed once the spacecraft departs the station. The mission will also

carry Northrop Grumman's SharkSat payload, an internally developed prototype supporting on-orbit technology demonstrations. Utilizing a streamlined development approach, SharkSat will allow engineers to evaluate emerging technologies in the space environment. SharkSat is driving rapid innovation in technology development processes and building Northrop Grumman's next generation of engineering leaders. Once its mission has been completed, Cygnus will perform a safe, destructive reentry into Earth's atmosphere over the Pacific Ocean.

Cygnus Spacecraft



Cygnus Launch Mass:
8,050 kg (17,700 lb.)

Propellant Mass:
800 kg (1,764 lb.)

Ascent Cargo Mass:
Approx. 3,400 kg (7,500 lb.)

Pressurized Volume:
27 m³

Height:
6.39 m (21 ft.)

Power Generation:
2 fixed wing UltraFlex™ solar arrays,
ZTI gallium arsenide cells

Descent Cargo Mass:
Up to 3,700 kg (8,100 lb.)

Antares Launch Vehicle



Diameter:
3.9 m (12.8 ft.)

Height:
42.5 m (139.4 ft.)

Mass:
290,000 - 310,000 kg
(639,341 - 683,433 lb.)

**Cygnus Advanced
Maneuvering Spacecraft**

Stage 2
Northrop Grumman
CASTOR® 30XL solid motor
with thrust vectoring

Stage 1
Liquid oxygen/kerosene
fueled

Northrop Grumman
responsible for system
development and
integration

Core tank designed and
verified by KB Yuzhnoye
(Zenit-derived heritage)

Core tank production by
Yuzhmash

Two Energomash RD-181
engines each with
independent thrust
vectoring