

America's new rocketship to the Moon

NASA's Constellation programme – which consists of a new Orion moonship and two separate Ares launch vehicles – utilizes components of the space shuttle and the 1960s Apollo Saturn V rocket. Constellation will allow astronauts to return to the moon and mount the first manned journey to Mars

1 Ares V launcher:
Shuttle-derived rocket will carry **Earth Departure Stage** and **Altair** lunar lander into low Earth orbit

2 Ares I launcher:
Lifts **Orion Crew Vehicle** into orbit
Launch abort system

Orion crew and service modules

Spacecraft adapter

Upper stage: One **J-2X** engine fuelled by liquid hydrogen and liquid oxygen

First stage:
More powerful, reusable solid-fuel rocket derived from current space shuttle solid rocket booster

Ares I will launch one day after Ares V and rendezvous with Altair/EDS module in 360km-high circular orbit

3 Low-Earth orbit: Orion Crew Vehicle docks with Altair lunar lander before four-day journey to Moon

Composite shroud – jettisoned shortly after launch

Altair lunar lander

Earth Departure Stage (EDS):
Single Saturn V **J-2X** engine

Interstage

Core stage

Two extended space shuttle solid-fuel rocket boosters

Modified space shuttle external tank fuels six **RS-68** engines

Orion Crew Vehicle

Service module

Crew module

Altair lunar lander

Ascent stage
carries four-person crew to and from lunar surface

Descent stage
carries fuel, power supply and oxygen for crew