

The History of our Solar System is found at Jupiter



Juno's goal is to understand the origin and evolution of the gas giant
Jupiter. Because gas giants form very early in the evolution of planetary
systems, what we learn about Jupiter will greatly enhance our understanding
of the evolution of our own solar system and, in fact, of our own planet Earth. Juno
will also vastly improve our general knowledge of how gas giant planets form and
evolve, shaping planetary systems everywhere.

Science Payload

Gravity Science and Magnetometers:

Study Jupiter's deep structure by mapping the planet's gravity and magnetic field

Microwave Radiometer:

Probe Jupiter's deep atmosphere and measures water and ammonia abundances

JEDI, JADE, and Waves:

Determine how the Jovian auroras connect the magnetosphere and atmosphere

UVS and JIRAM:

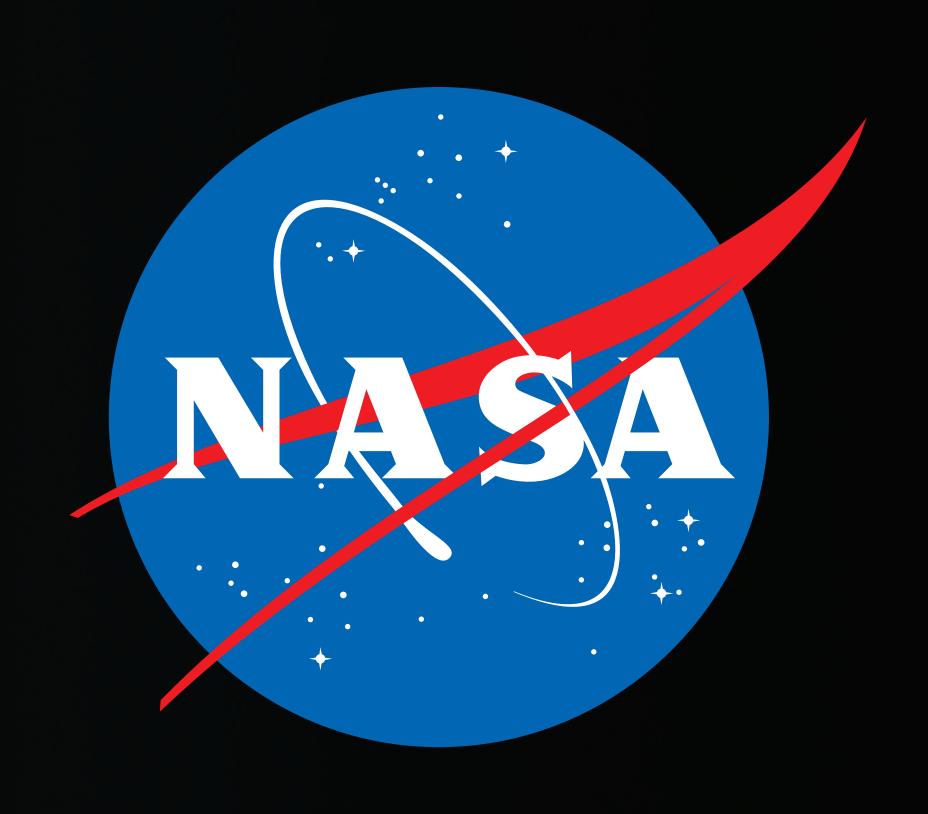
Provide ultraviolet and infrared images of the atmosphere and auroras; take the chemical fingerprints of the gases present



JADE JunoCam JEDI UVS

Mission Firsts:

- Juno is the first solar-powered spacecraft to go to Jupiter. Jupiter's orbit is five times farther from the Sun than Earth's so it receives 25 times less sunlight than the Earth. The Juno spacecraft is designed to operate at this great distance from the Sun and its solar panels measure ~30 feet in length in order to generate sufficient power.
- A zone of extreme radiation circles Jupiter's equator and its potential for damaging space craft electronics is the chief limiting factor for the mission lifetime. To help cope with this radiation, Juno's most sensitive electronics are housed in a protective vault that cuts down the radiation hazard by a factor of 800.
- After launch, the Juno spacecraft will become the fastest spacecraft ever and will loop around the inner Solar System, then swinging by Earth to use our planet's gravity field to enable it to reach and orbit Jupiter.
- Juno will be the first spacecraft to sample the Jovian Auroras.



Jupiter's Interior and Atmosphere

There are some very basic things that we do not know about Jupiter's interior—such as whether or not it has a solid core and how and where its magnetic field is produced. These are critical pieces of information because the record of Jupiter's origin and early evolution lies deep within its interior. Juno will reveal the planet's interior by mapping the gravitational and magnetic fields with sufficient resolution to constrain Jupiter's interior structure, the origin of the magnetic field, the core mass, and the nature of deep convection.

The most fundamental question about the Jovian atmosphere is how deep Jupiter's colorful zones, belts, and other features penetrate. Juno's microwave radiometer can see deep into the atmosphere and will allow us to determine for the first time the global structure and motions of the planet's atmosphere below the cloud tops by mapping variations in the atmosphere's composition, temperature, clouds and patterns of movement down to unprecedented depths.

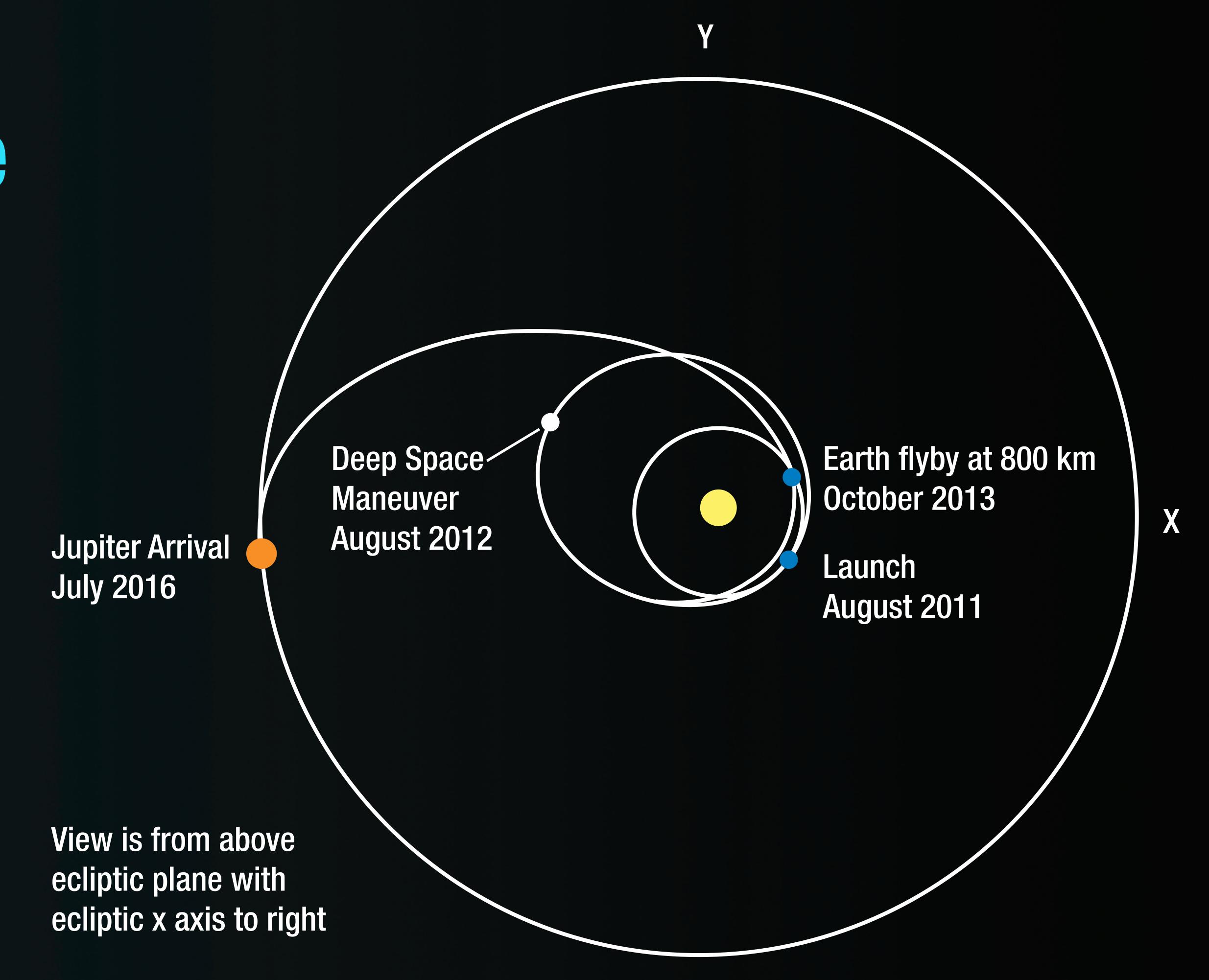
Mission Timeline

Launch—August 2011

Earth Flyby— October 2013

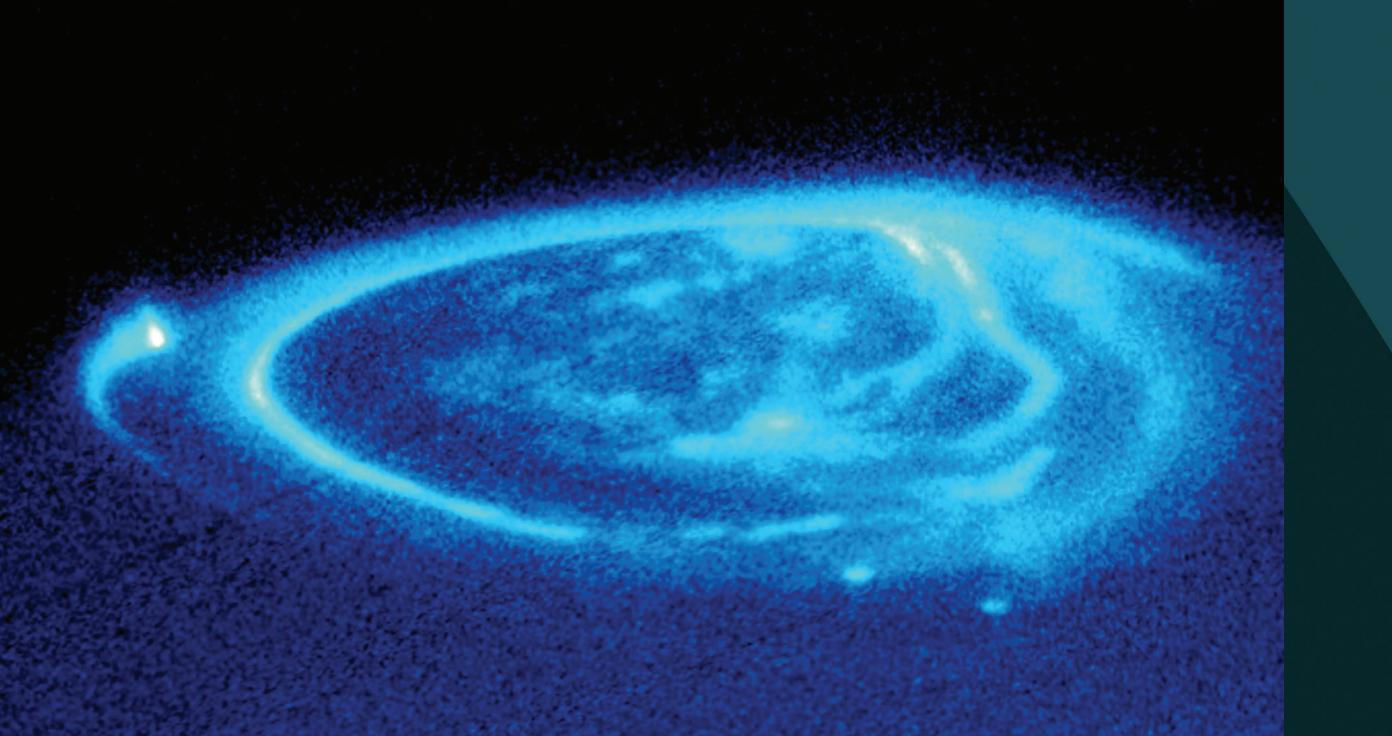
Jupiter Arrival—July 2016

End of Mission—October 2017



Jupiter's Auroras

Jupiter has auroras similar in some ways to the Earth's northern and southern lights, but the Jovian auroras also have intriguing unique features such as bright spots driven by some of Jupiter's moons that circle in the polar regions. Regardless of their sources, the auroras are all caused by the impact of charged particles flowing down into the atmosphere along the magnetic field. Jovian auroras have been observed remotely for some rime, but Juno will be the first to directly sample the charged particles and the magnetic fields near Jupiter's poles.



Jupiter Facts

Day = 10 hours

Diameter = 11x Earth's diameter

Mass = 318 x Earth's mass

Distance from Sun = 5 x Earth's

Year = 12 Earth years

