# 1 High level goals

# 2 Mission drivers

# 3 Functional analysis

# 4 Main mission phases

The JUNO mission was divided into five phases: Launch, Cruise, Insertion, Science Operations and Deorbit.

## 4.1 Launch

The launcher is the Atlas V551: it's a two stage rocket which uses a standard Atlas booster plus five solid rocket boosters in the first stage ans a Centaur upper stage in the second. The phase begins with the ignition of the solid rocket boosters. Upon the burnout of the solid rocket boosters, they are stagger jettsioned. The payload fairing jettison occurs 3.5 minutes after launch. The first stage separation occurs approximatively six seconds after the booster cutoff. The first centaur burn lasts six minutes, and co pletes when the vehicle has achieved its parking orbit. During the parking orbit coast period (approximatively 5 min) the Centaur turns itself and the spacecraft to the desired attitude for thestart of the second burn, which places JUNO on the desired departure trajectory. The spacecraft separates from the Centaur three-and-a-half minutes later the completion of the second Centaur burn. JUNO's solar panels were deployed about five minutes after the separation from the second stage.

## 4.2 Cruise

At the beginning of this ohase, the spacecraft was injected in an interplanetary trajectory with the aim of reaching Jupiter. The cruise had a duration of about five years, during which two deep space manoeuvers and an Earth fly-by were performed. All manoeuvers will be better described in section 7. This phase also included instruments testing and verification, to ensure they were functioning properly and ready for the usage during the mission. This phase was also characterized by initial sicence observations of Jupiter.

## 4.3 Insertion

This phase begins four days before the start of orbit insertion manoeuvre and ends one hour after the start of the orbit insertion manoeuvre. The latter occurs at closest approach to Jupiter and slows the spacecraft enoughto let it be captured by Jupiter in a 107 days period orbit. The Jupiter orbit insertion burn was performed by the main engine, and it lasted 30 minutes. After the burn, the spacecraft was in a polar orbit aorund Jupiter.

# 5 ConOps

# 6 Payload analysis

# 7 Mission analysis