Mars Cube One (MarCO)

The First Planetary CubeSat Mission

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Mission Motivation

✧ InSight has no direct-to-Earth link during critical landing
  • MRO to relay EDL data hours later
✧ MarCO provides real-time data relay
✧ A technical demonstration that can prove valuable to future missions
✧ Strategic advantages: NASA leadership role
  • Pave path to future small spacecraft
  • Reduce risk to future landed missions
  • Innovation & exploration
  • Public & University engagement
  • Open a window for new science opportunities
Why Launch in March 2016

- Mars at 1.07 AU in 2016
- Sufficient mass margin on launcher
- No negative impact on InSight

Other Features:
- Can fly on their own to Mars
  - Trajectory Correction Maneuvers
- Slow flyby of Mars
Arrival in September 2016

- Phobos
- InSight
- CubeSat
- To Sun
- To Earth

Distance: 3500km
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First Planetary CubeSat Mission

A Technology Demonstration of communications relay system for mission-critical events such as the 2016 InSight entry, descent, & landing.

Interplanetary Travel
Fly-by Mars

- Two redundant 6U CubeSat form factor
- Real-time relay of InSight EDL data
  - 8 kbps UHF link: InSight to MarCO
  - 8 kbps X-band link: MarCO to DSN
InSight Released First

MarCO Released After Maneuver