Webb Overview

Organization

- Customer: NASA Goddard Space Flight Center
- International collaboration with ESA & CSA
- Operations: Space Telescope Science Institute (STScI)

Description

- Optimized for infrared observations (0.6 – 28 micrometer)
- Deployable telescope with 6.5m primary mirror
- Cryogenic telescope and instruments
- Launches on ESA-supplied Ariane V
- 5-year science mission (10-year goal)

L2 the 2nd Lagrange Point of the Sun-Earth system

- 1.5 million km from Earth
- Protected from stray light and heat
- Earth won’t obstruct
Webb Observatory

**Integrated Science Instrument Module (ISIM)**
Contains 4 Science Instruments

**Optical Telescope Element (OTE)**
- Active 6.5 meter Three Mirror Anastigmat.
- 18 Segment Primary Mirror

**Sunshield**
5 layers of thermal shielding to allow optics and instruments to passively cool to required cryogenic temperatures

**Spacecraft Bus**
Contains traditional “ambient” subsystems

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Hardware Fabrication Completion Status

Primary Mirror Segments: 100%
Aft Optics System Bench: 95%
Primary Mirror Support Structure: 75%
Tertiary Mirror: 100%
Fine Steering Mirror: 95%
Secondary Mirror: 90%
Secondary Mirror Supports: 90%
Spacecraft Bus: 25%
Sunshield Membranes: 10%

Science Instrument Module & Science Instruments: 90%

Green borders denote actual spaceflight hardware images, red borders are test equipment.

As of 9/1/2011
Development Work

- Completed Optical Telescope Element, Sunshield, and Mission CDR
- Demonstrated critical backplane technologies, fabrication underway
- Significant development and risk reduction testing completed
Primary Mirror Segments

- All 18 flight primary mirror segments and one spare have been fully assembled
- All 18 flight primary mirrors are through final polish at Tinsley
- All 18 flight primary mirrors are through coating at QCI
- Second of three batches of 6 coated mirrors have completed final cryo-optical verification at NASA MSFC XRCF
Mirror Progress
All AOS components are all through assembly-level integration and test with the exception of the FSM (complete on 10/10)
Mirror Installation

Critical early demonstration of the mirror installation process

Test Bed Structure

Optics Integration Gantry System

PMSA Alignment and Installation Fixture

Robotic arm with Mirror Simulator

PMSA Verification Test Stand

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Optical Telescope Assembly Stand Fabrication Completed
Sunshield Template Layer