RECENT UPDATES

Programmatic
- NASA and Northrop continuing to work but with COVID19 social distancing protocols meaning some reduced efficiencies
- LRD Schedule changed to 31-October-2021 (7-month shift)
- Sufficient funds available in development budget

Observatory
- Completed Environmental tests (acoustics, vibration)

Science and Operations
- Ground segment testing and operations rehearsals restarted
  - 11 rehearsals at various levels (e.g., science instrument, deployment, full-up) planned for next 12 months
  - Increasing on-site personnel with each rehearsal, consistent with COVID19 social distancing and cleaning protocols
- Call for Cycle 1 General Observers due date 24-November-2020 (41 days from today)
SIMPLIFIED SCHEDULE

2020

2021

0 1 2 3 4 5 6 7 8 9 10 11 12

ON D J F M A M J J A S O N D

days of project funded critical path (mission pacing) schedule reserve

Deployments and Final Stow

Final Build & Shipping Prep

Observatory

Development, Testing, Release

Ground System

Science

GO Proposals Due

TAC

Northrop-Grumman

Space Telescope Science Institute

Guiana Space Center
## Fiscal Year 2021 JWST HQ Milestones

<table>
<thead>
<tr>
<th>Month</th>
<th>Milestone</th>
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<tr>
<td>Oct-20</td>
<td>1 Complete Observatory Environmental Testing</td>
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<tr>
<td>Nov-20</td>
<td>2 Complete Post Environmental Testing Spacecraft Bus Deployments</td>
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<tr>
<td>Dec-20</td>
<td>3 Complete Post Environmental Testing Sunshield Deployments</td>
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<td>Jan-21</td>
<td>4 Complete Comprehensive System Test #5</td>
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<td>Feb-21</td>
<td>5 Complete Cycle 1 Geneal Observer Proposal Reviews</td>
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<td>Mar-21</td>
<td>6 Sunshield Fold Complete</td>
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<td>7 Launch Readiness Exercise #2</td>
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<td>Apr-21</td>
<td>8 Final Deployable Tower deployment</td>
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<td>May-21</td>
<td>9 Final Observatory Stow Complete</td>
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<td>10 Observatory Pre-Ship Review</td>
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<td>Jul-21</td>
<td>11 Launch Readiness Exercise #4</td>
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<td>Aug-21</td>
<td>12 Operational Readiness Review</td>
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<td>13 Ship Observatory to Launch Site</td>
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Blue font (underline) denotes milestones accomplished ahead of schedule, orange font denotes milestones accomplished late.
REMAINING I&T STEPS

OBS Final Build
- Install & Walkout DRSAs
- Install Solar Array
- Final Build OBS Ops

Deploy DTA #4
- Install Fwd and Aft MRDs (84 total)
- Stow DTA #3
- Stow midbooms, CCRS, Cable Brake
- Fold Sunshield membranes
- Release & deploy MSA and membranes
- Release CCRS
- Release & deploy Fwd MCA
- Release & deploy DTA #3
- Stow Core, UPS move to horizontal
- Membrane repairs
- Tension & de-tension membranes

Install Fwd and Aft MRDs (84 total)
- Release & deploy J2 Wing
- Release IEC, CJAA, ADIR +V3
- Stow -J2 Wing

Stow DTA #4
- CST5 / GSEG4

Observatory Deployments
- Midboom tip & DTA tray release
- Release & deploy DTA #3
- Release & remove Solar Array
- Install Flight Battery

Deploy Solar Array offline
- GAA, CCA, STSA release
- Release & walkout Aft flap
- Bipod/MRD release
- Deploy Fwd & Aft UPS

Blue box indicates first time activity
FUND SCHEDULE RESERVE

Date

- Recommended Reserves
- Project Reserve
- Events

Funded Schedule Reserve (Days)

Aug 20, Sep 20, Oct 20, Nov 20, Dec 20, Jan 21, Feb 21, Mar 21, Apr 21, May 21, Jun 21, Jul 21, Aug 21, Sep 21, Oct 21, Nov 21

Observatory
Pre-ship Review
Ship to Kourou
Launch

Reserve uses: (1) Bldg M4 issues, additional Z-axis vibe run
TECHNICAL ISSUES
STATUS
MEMBRANE RELEASE DEVICES (MRD) & NON-EXPLOSIVE ACTUATORS (NEA)

• MRD
  • Evaluation of simultaneous ascent (mechanical, acoustic) and pressure loads show negative margins on some highly-loaded MRDs
  • Built 5 new MRDs with new material. Three were installed for Observatory environments, 2 went through a series of offline tests.
  • **Resolution:** All MRDs will have positive margins based on either additional proof testing or replacing Collets and Stems with alternate material

• NEA
  • The NEA for one sunshield MRD failed to release when actuated using the redundant side only electrical signal.
  • The NEA fired correctly when signaled on the primary side.
  • The anomaly has been localized to the NEA portion of this actuator
  • New NEAs being manufactured and will be ready in time for installation during final observatory stow before shipping.

Blue underlined text indicates changes from last meeting
REMANUFACTURED DRSA-H

• The Deployable Radiator Shade Assembly – Horizontal system redesign of the slip joint interfaces is complete. The tube and node structure is undergoing reassembly and then qualification testing.

• Two of the 4 DRSA-H panels are completely reassembled and the other two are in their final stages of reassembly. Membranes installed on one of two completed panels. They will all be completed long before they are needed for final testing (see chart 5).
FAIRING DEPRESSURIZATION

• Issue: Residual air trapped in folded sunshield membrane may cause an over-stress condition at the time of fairing separation due to the residual pressure ($\Delta\text{pressure} \leq 90$ pascals, capability 18 pascals).

• Actions:
  - More sensitive pressure transducers flown on three Ariane 5 flights confirm that there is residual pressure within the fairing that exceeds the capabilities (measured values ~ 55 Pa).
  - Passive open-vents first flight 18-Feb measured value ~32 Pa (~65 deg opening)
  - Second flight with passive vents included 1] the new vents (opened to the full 80 deg) and 2] a sealed fairing to trap residual air in the fairing honeycomb, measured 31 Pa

Blue underlined text indicates changes from last meeting
FAIRING DEPRESSURIZATION

- **Plan:** Determine that the Sunshield MRDs, membranes and telescope and spacecraft hardware can tolerate 2X fairing pressure level at jettison (i.e., 0.36 Pa). This is a joint NASA and Northrop effort.

- Meeting was held on September 15th to outline a path forward.
  - MRD assessment is the highest priority, need to define if additional proof testing is required
  - Membrane and cover work will proceed in parallel

- NASA and Northrop will perform initial independent assessments as cross-checks.

- Goal is to have all identified work completed by December 15th.
FASTENER RETORQUING

- **Issue Description:**
  - Data sampling method used during installation of fasteners specified to be torqued “above run-in torque” was inadequate to capture the full range of running torques.

- **Action Plan/Status:**
  - Re-audit of all JWST drawings that require above run-in torque (COMPLETE)
  - Pre-OBS Environment Assessment (COMPLETE)
  - Identification of hardware rework prior to Post-OBS Deployments (COMPLETE)
  - Flight Exoneration (COMPLETE)
  - Identification of hardware rework after Post-OBS Deployments (COMPLETE)
  - Running Torque Flight Exoneration Review/Technical Interchange Meeting (COMPLETE)

- **Expected Resolution:**
  - Fasteners Re-torqued or Exonerated by Analysis Prior to Launch
  - NG recommended rework areas: No Pre-Deployment Rework recommended; Post Deployment Rework recommended list discussion at 9/25 technical interchange meeting, also reviewed by SRB.
PREPARING PROPOSALS

• Visit https://www.stsci.edu/jwst/science-planning/proposal-training

• Many tutorials and examples from Master Classes to help you prepare your proposal and inform you how to get additional assistance
BACKUP
Webb on the vibration table at Northrop Grumman
Since the September 2011 replan JWST reports high-level milestones monthly to numerous stakeholders.

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<th>FY</th>
<th>Total Milestones</th>
<th>Total Milestones Completed</th>
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*Milestone accounting in FY2014 was complicated by the government shutdown and multicomponent milestones. *Milestone reporting stopped during COVID-19 impacted months.