



# JWST Update

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

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



Observatory



GO Proposals Due



TAC

Science



Northrop-Grumman



Space Telescope Science Institute



Guiana Space Center



# Fiscal Year 2021 JWST HQ Milestones

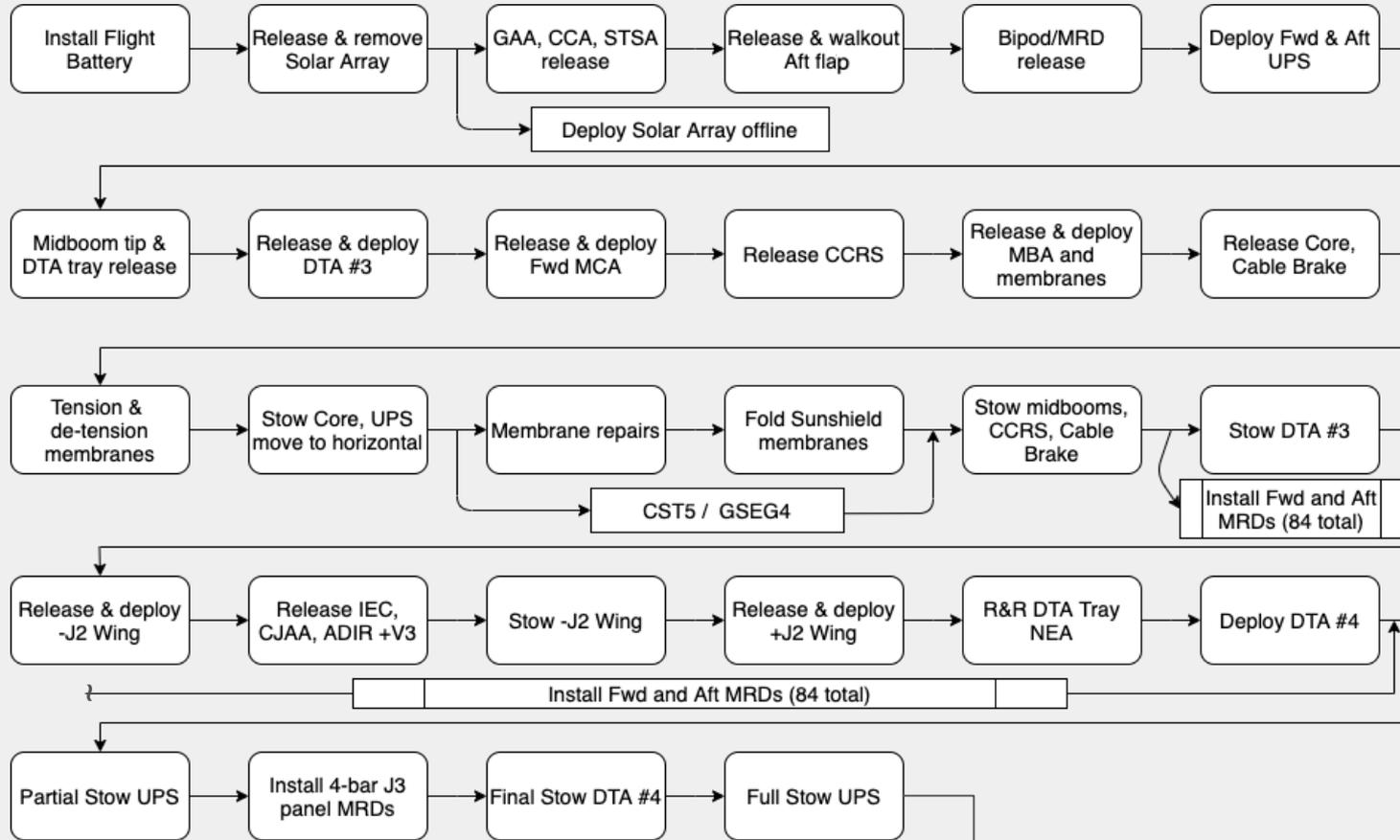
Month	Milestone	Comment
Oct-20	1 Complete Observatory Environmental Testing	<u>Completed 10/2/20</u>
Nov-20		
Dec-20	2 Complete Post Environmental Testing Spacecraft Bus Deployments	
Jan-21	3 Complete Post Environmental Testing Sunshield Deployments	
Feb-21	4 Complete Comprehensive System Test #5	
Mar-21	5 Complete Cycle 1 General Observer Proposal Reviews	
	6 Sunshield Fold Complete	
	7 Launch Readiness Exercise #2	
Apr-21		
May-21	8 Final Deployable Tower deployment	
Jun-21		
Jul-21	9 Final Observatory Stow Complete	
	10 Observatory Pre-Ship Review	
	11 Launch Readiness Exercise #4	
Aug-21	12 Operational Readiness Review	
	13 Ship Observatory to Launch Site	
Sep-21		

Blue font(underline) denotes milestones accomplished ahead of schedule, orange font denotes milestones accomplished late.

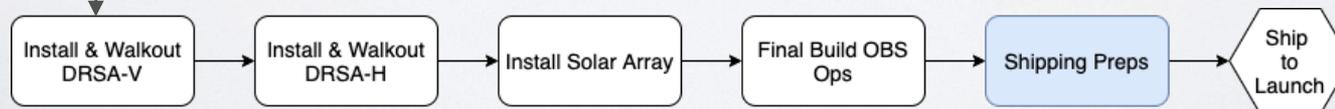
# REMAINING I&T STEPS



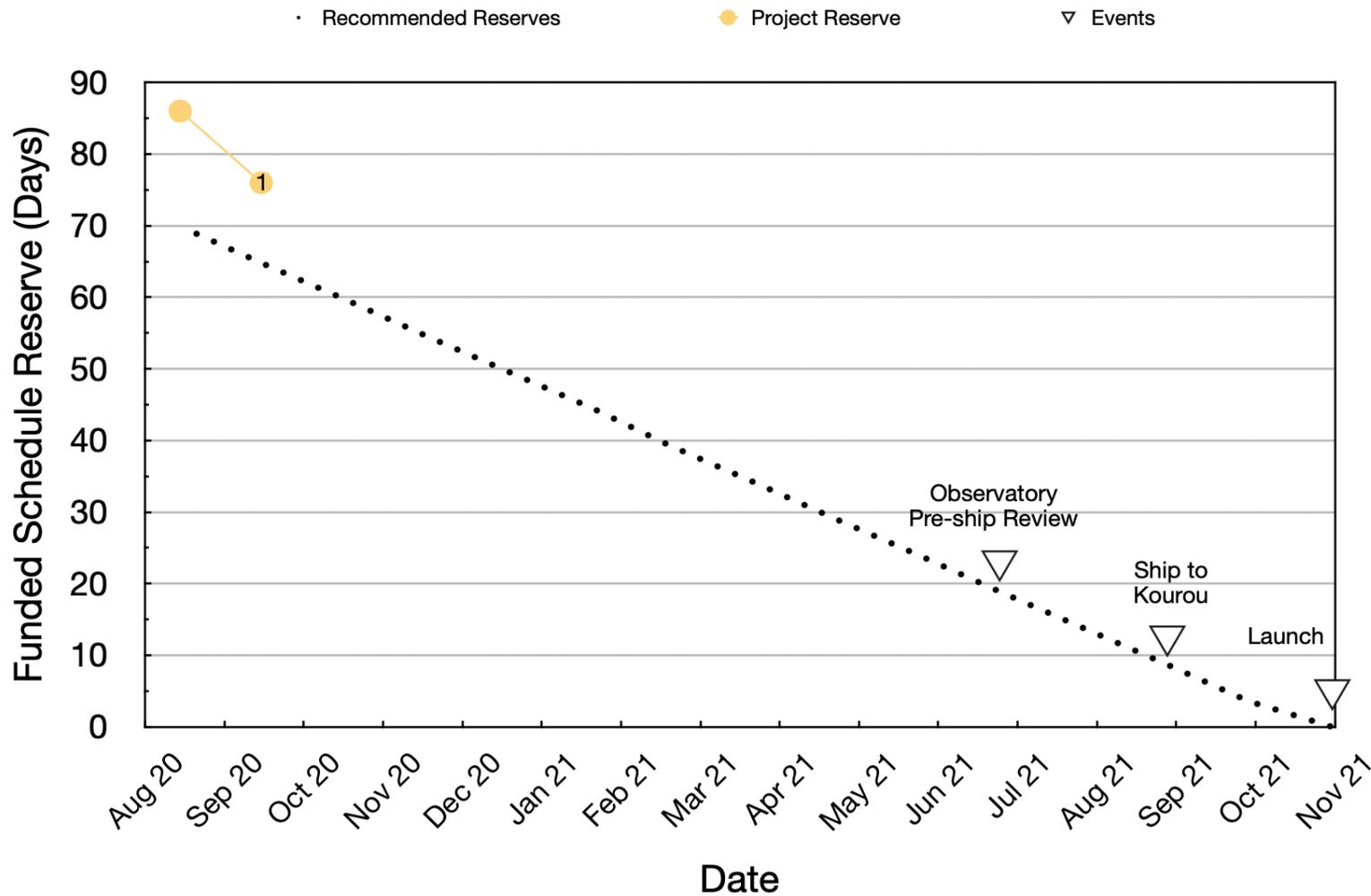
Observatory Deployments



OBS Final Build



# FUNDED SCHEDULE RESERVE



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 ( $\Delta pressure \leq 90$  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  $\sim 55$  Pa).
  - Passive open-vents first flight 18-Feb measured value  $\sim 32$  Pa ( $\sim 65$  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



Fairing Vent

# 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



The screenshot shows the STScI JWST Science Planning website. The main heading is "PROPOSAL PREPARATION TRAINING". Below this, there is a navigation menu with links for Home, About, News & Events, Instrumentation, Science Planning, Observing Programs, and Documentation. The page content includes a section titled "Preparing the Community" which describes the JWST Master Class and local workshops. A "Workshop in a Box" section provides a list of downloadable materials, including "Community Workshops (2020)", "Workshop-in-a-Box: Homework", "Workshop-in-a-Box: Overview Talks", "Workshop-in-a-Box: Takeaways", "Workshop-in-a-Box: Hands-on Support Materials", and "Workshop-in-a-Box: Additional Support Materials". The footer contains contact information for technical assistance, social media links for JWST Observer, and a list of resources like Who We Are, Webcasts, MAST, News Center, MYST, Contact Us, Opportunities, and Events.

- 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*

# ENVIRONMENTAL TESTING NEWS STORY





# MILESTONE PERFORMANCE

- Since the September 2011 replan JWST reports high-level milestones monthly to numerous stakeholders

	<b>Total Milestones</b>	<b>Total Milestones Completed</b>	<b>Number Completed Early</b>	<b>Number Completed Late</b>	<b>Deferred to Next Year</b>	<b>Deferred more than one quarter</b>
FY2011	21	21	6	3	0	0
FY2012	37	34	16	2	3	3
FY2013	41	38	20	5	3	2
FY2014❖	36	23	10	8	11	10
FY2015	48	44	22	12	4	3
FY2016	45	39	25	7	6	2
FY2017	38	32	12	13	8	5
FY2018	31	18	7	2	13	13
FY2019	25	22	10	10	3	2
FY2020	17*	12	5	0	0	0
FY2021	13	1	0	0	0	0

❖ Milestone accounting in FY2014 was complicated by the government shutdown and multicomponent milestones. \*Milestone reporting stopped during COVID-19 impacted months