

OTE Omni  
Secondary Mirror Support Structure  
Frill

Secondary Mirror Assembly  
Secondary Mirror  
18 Segment Primary Mirror  
Aft Optics Subsystem

# James Webb Space Telescope

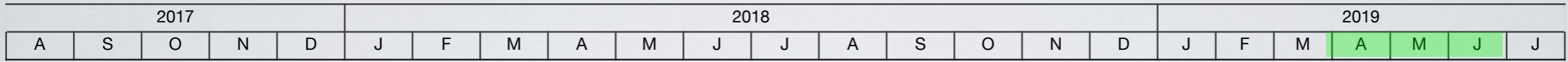
Stationkeeping SCAT Thrusters  
Spacecraft Bus Radiation Shades  
-J2 Equipment Panel  
Star Trackers  
Spacecraft Omni  
LV Adapter Ring  
Gimballed Antenna Assembly

Sunshield Layer 5  
Forward Spreader Bars  
Sunshield Layer 1  
Forward UPS Assembly  
Mid Boom  
Mid Spreader Bar  
Membrane Tensioning System  
Spacecraft Bus

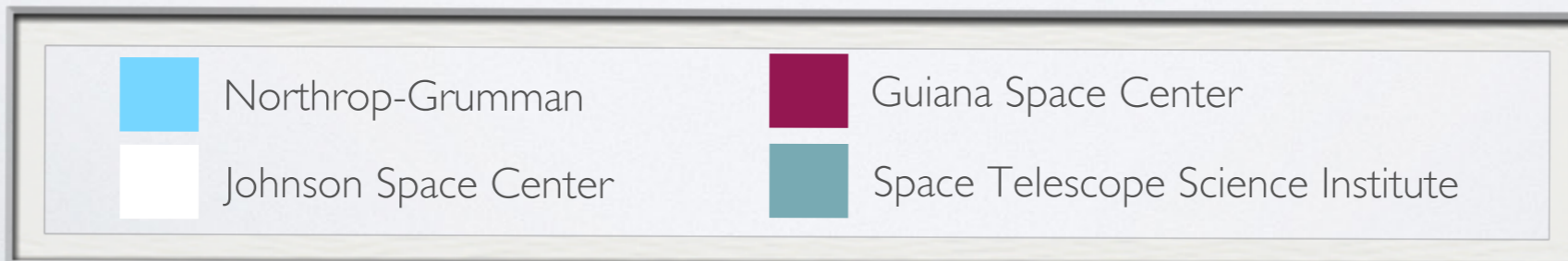
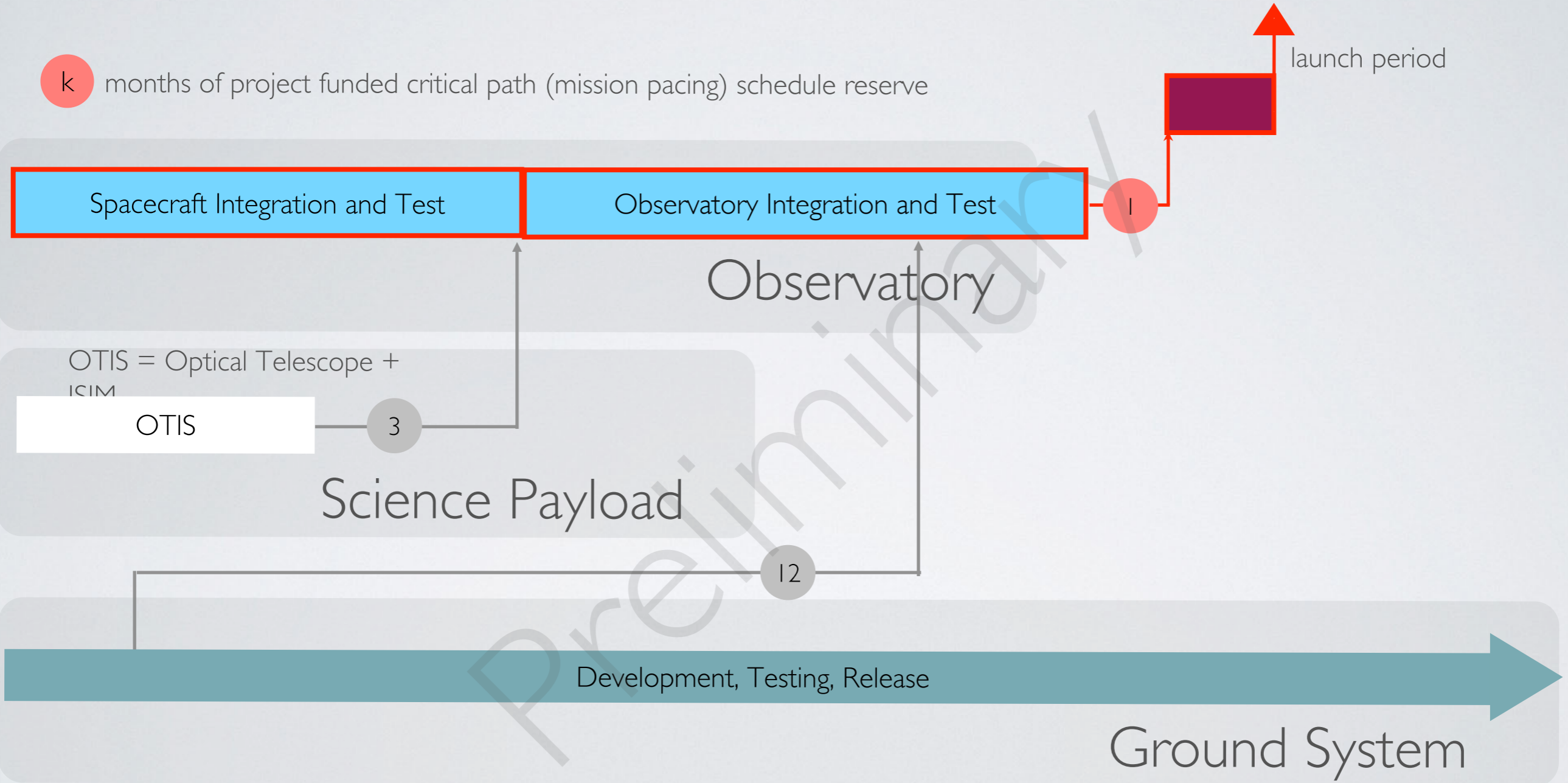
October 24, 2017

Eric P. Smith  
JWST Program Director/Program Scientist

# SIMPLIFIED SCHEDULE



k months of project funded critical path (mission pacing) schedule reserve



# S&OC SUBSYSTEMS

Subsystem	Build	Development completion date	I&T completion date	Status	% of requirements delivered to date	% of requirements verified to date
Data Management Subsystem (DMS)	7	December 2016	June 2017	Completed I&T	89%	80%
	7.1	November 2017	February 2018	In Development		
Proposal Planning Subsystem (PPS)	14	December 2016	June 2017	Completed I&T	97%	91%
	14.1	June 2017	December 2017	Completed Development		
	14.2	November 2017	January 2018	In Development		
Wavefront Sensing & Control (WFS&C) Software Subsystem	6.1	December 2017	February 2018	In Development	97%	97%
Flight Operations Subsystem (FOS)	6.0.5	June 2017	July 2017	Completed I&T	83%	80%
	6.1	November 2017	December 2017	In Development		
Operations Scripts Subsystem (OSS)	6	March 2017	November 2017	In Level 2 Certification Testing	73% Level 2 certified	58% Level 3 certified
	7	October 2017	March 2018	In Development		
Project Reference Database Subsystem (PRDS)	4.13	April 2017	April 2017	Sustaining Engineering Release	100%	100%
	4.14	May 2017	May 2017	Sustaining Engineering Release		

# OTIS

2017/10/16 09:52:01 CDT

Chamber Temperature\*

**65.930°F**

18.850°C 292.000 K

Houston Temperature

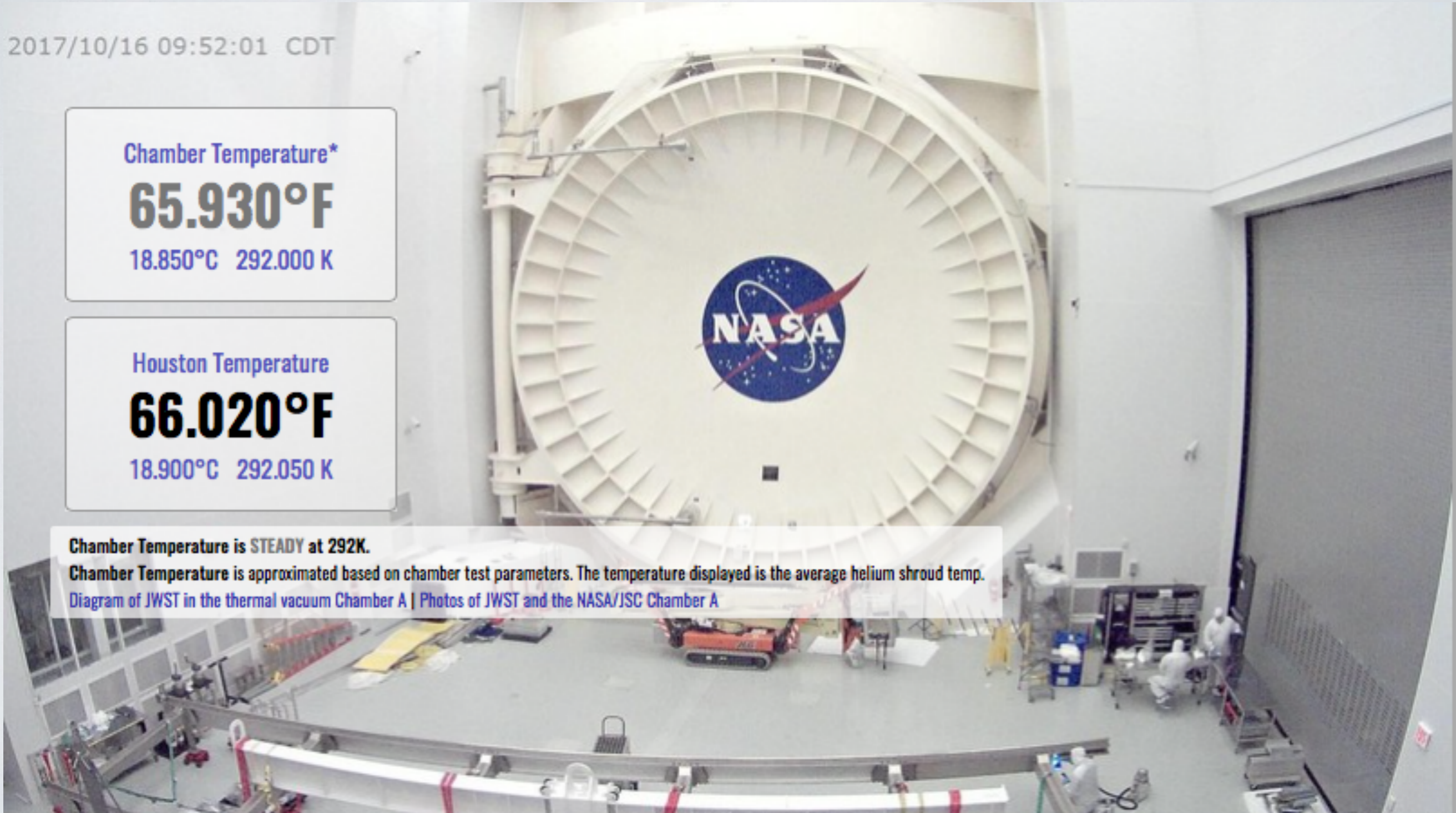
**66.020°F**

18.900°C 292.050 K

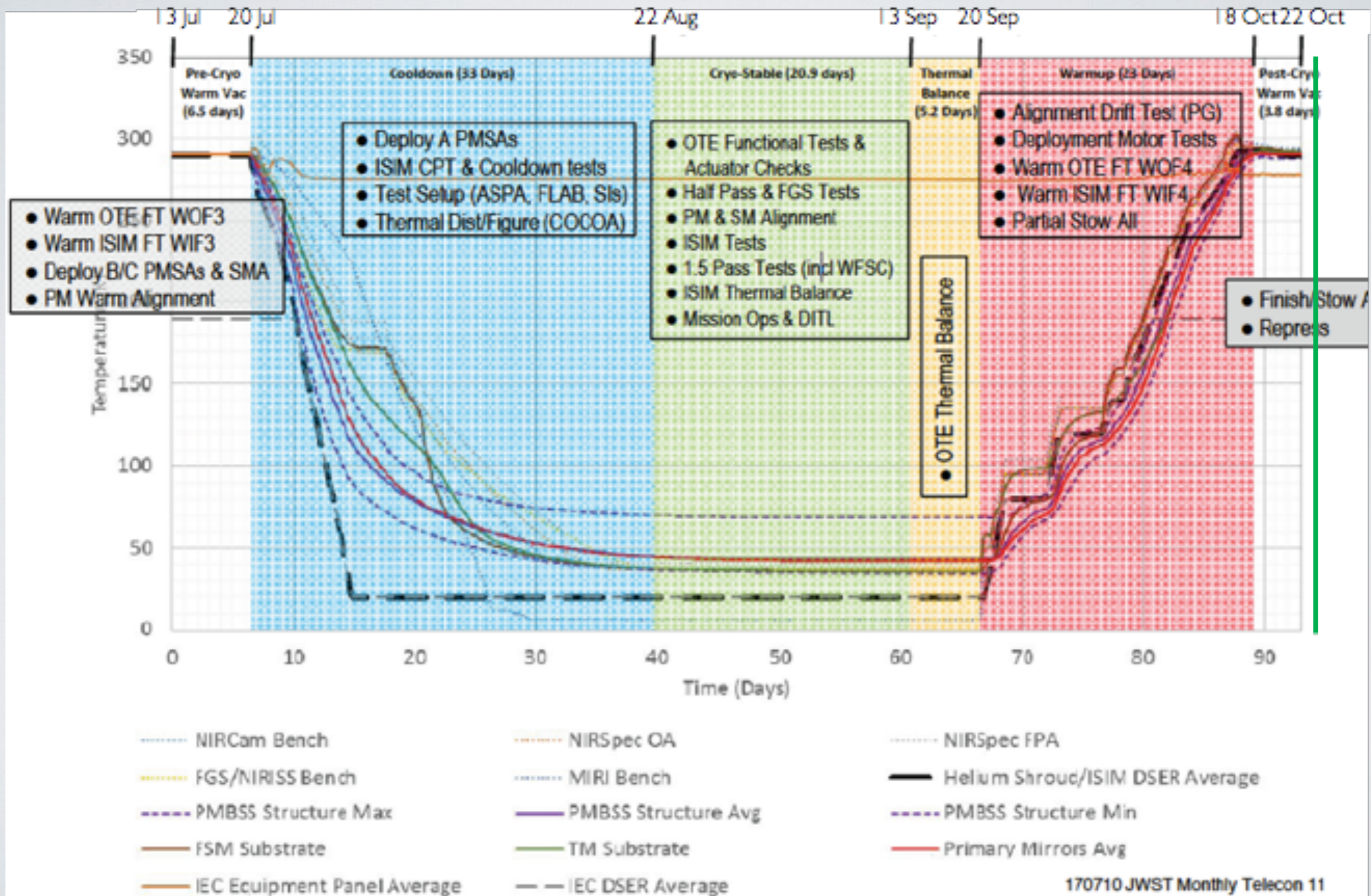
**Chamber Temperature is STEADY at 292K.**

**Chamber Temperature is approximated based on chamber test parameters. The temperature displayed is the average helium shroud temp.**

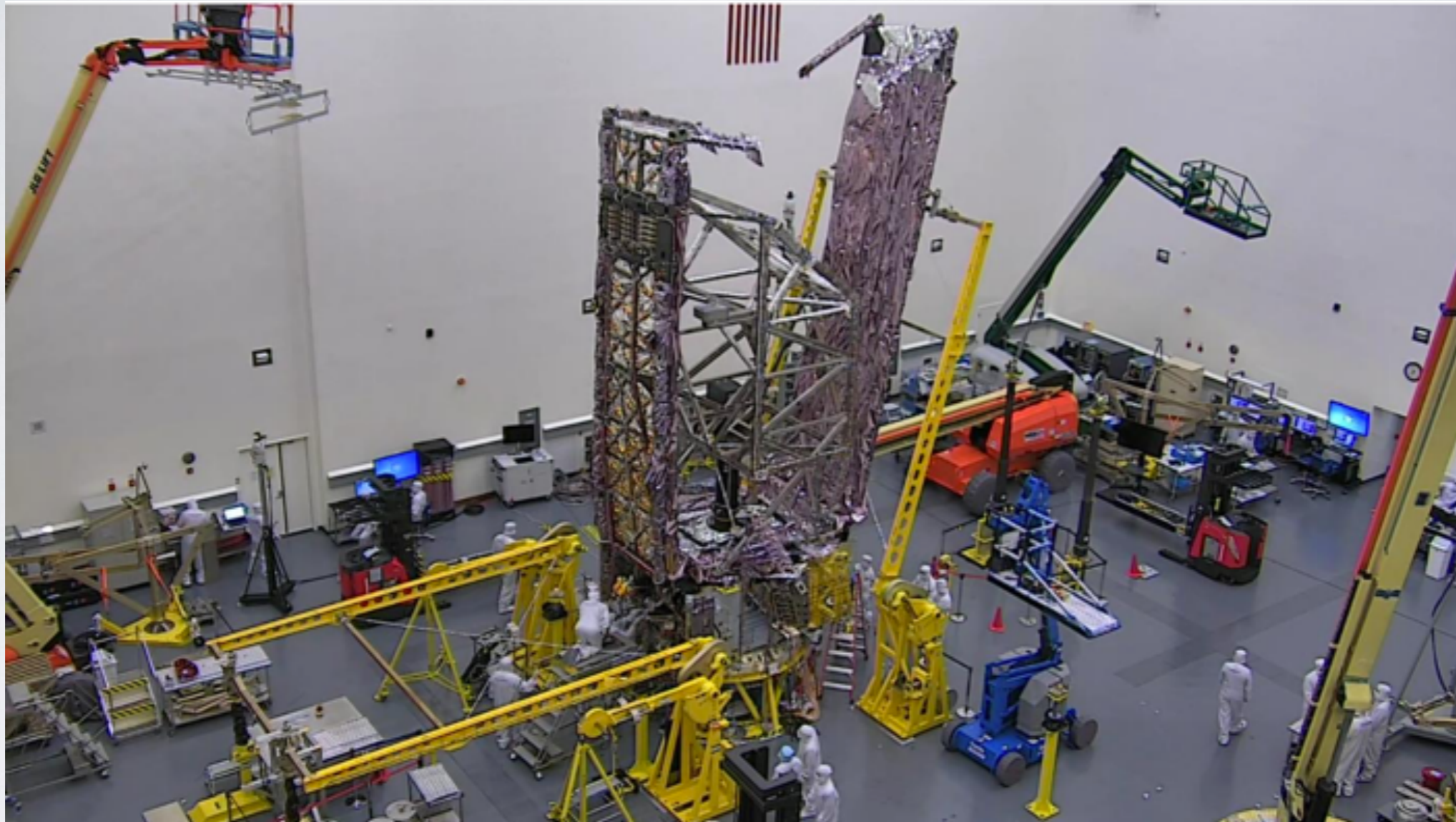
**Diagram of JWST in the thermal vacuum Chamber A | Photos of JWST and the NASA/JSC Chamber A**



# OTIS TEST TIMELINE



# SPACECRAFT ELEMENT



Stowing to launch configuration prior to deployment testing

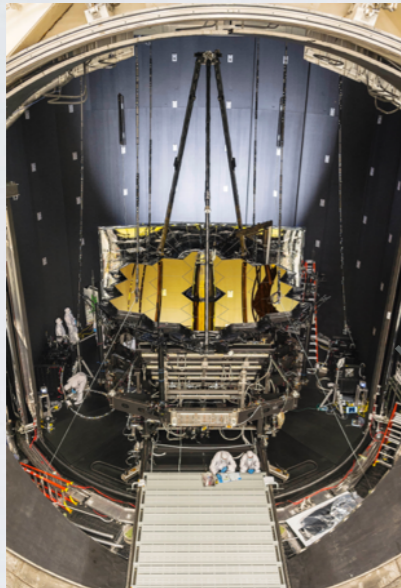
# DEPLOYMENT TESTING

- ☑ Aft and Forward Unitized Pallet Structures
- ☑ All Membrane Release Devices
- ☑ Aft and Forward Membrane Covers
- ☑ Mid-boom deployment
- ☑ Sunshield Core
- ☑ Membrane tensioning

# REMAINING ACTIVITIES

☑ OTIS Cryovacuum testing

• OTIS Deployments at NGAS



☑ Spacecraft Integration

☑ Sunshield (SS) Skeleton Deployments

☑ SS Membrane Integration

☑ Spacecraft Element (SCE) Electrical test

☑ SS Fold, Stow, and Configuration for Flight

• SS Pre-Environmental Deploy, Fold, and Stow

• SCE Acoustics, Vibe, and Thermal Vacuum test

• Post-Environmental SS Deploy & Test

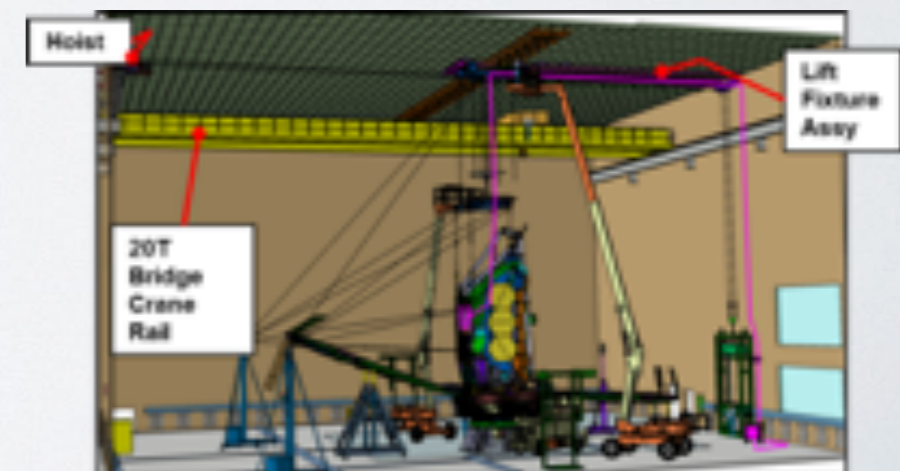
## Observatory Integration

• Observatory Electrical Test

• Pre-Environmental Observatory Deployment

• Observatory Vibration, Acoustics

• Observatory Deployment (all deployments retested)





# HQ WATCH LIST

- FY 18/19 budget reserves
  - FY18 is a year of significant integration and test activities, where UFE likely to be needed to address any issues that arise
    - OTIS cryovac testing proceeding according to cost plan
    - NGAS workforce remains high, not rolling off according to current plan
  - Change in launch window will consume much of FY18/19 budget reserves
- Based on JWST schedule risk assessment, launch readiness date changed from Oct 31, 2018 to a window of March 31
  - June 30, 2019, in coordination with ESA (additional coordination performed by ESA with Arianespace)
  - After change in launch readiness date, and after consumption of schedule reserve due to liens noted in previous FPRs, new critical path schedule reserve is 4 months
  - Schedule is preliminary, pending further schedule information from NGAS, and project assessment of that information.
  - Critical path goes through spacecraft element (spacecraft bus and sunshield) and observatory I&T.
  - Schedule impact of monopropellant thruster valve leakage resolution will be determined after resolution path determined.
- Propulsion subsystem - Leaks in small monopropellant thruster valves, all 16 valves removed from spacecraft, will require replacement or rework. Options for reattachment also being evaluated.
- OTIS 18 Hz mode – Design, manufacturing, installation of particle dampers on aft optics assembly after cryovacuum testing

# Fiscal Year 2017 JWST HQ Milestones

Month	Milestone	FY2016 Deferral	Comment
Oct-16	1 Complete portable clean room for Telescope and Science Instruments (OTIS)		<u>Completed 10/13/16</u>
	2 Complete final checkout of new shaker tables at Goddard Space Flight Center		• <u>Completed 10/13/16</u>
	3 Begin making electrical connections between spacecraft panels		<u>Completed 10/7/16</u>
	4 Complete Sunshield Mid-Boom Assembly #2 functional test		• <u>Completed 12/5/16</u>
Nov-16	5 Start optical measurements of OTIS prior to vibration and acoustic tests		<u>Completed 10/24/16</u>
	6 Deliver Science and Operations Center release 1		<u>Completed 9/30/16</u>
	7 Perform Cryocooler installation into the spacecraft bus and begin functional testing		<u>Completed 10/29/16</u>
	8 Complete Aft Unitized Pallet Structure assembly		• <u>Completed 10/29/16</u>
	9 Deliver Aft Unitized Pallet Structure to Observatory I&T		• <u>Completed 3/14/17</u>
Dec-16	10 Deliver Forward Sunshield Pallet Structure to Observatory Integration and Test (I&T)		• <u>Completed 3/28/17</u>
	11 Start OTIS vibration and acoustic testing program		<u>Completed 11/19/16</u>
	12 Complete final test of engineering model of telescope center section at Johnson Space Center (JSC)		<u>Completed 10/31/16</u>
	13 Deliver sunshield flight membranes to Observatory I&T		<u>Completed 12/15/16</u>
Jan-17	14 Complete OTIS vibration and acoustics testing		<u>Completed 3/2/17</u>
	15 Deliver observing proposal and planning subsystem software build that supports launch		<u>Completed 1/12/17</u>
	16 Complete electrical testing of the spacecraft at Northrop-Grumman		<u>Completed 3/7/17</u>
Feb-17	17 Complete OTIS optical measurements after vibration and acoustic tests		<u>Completed 3/31/17</u>
	18 Deliver wavefront and control software that supports launch (controls telescope mirror shape)		<u>Completed 1/20/17</u>
	19 Deliver horizontal deployable radiators to Observatory I&T		<u>Completed 7/13/17</u>
Mar-17	20 Deliver OTIS to the Johnson Space Center		<u>Completed 5/7/17</u>
	21 Deliver the pre-launch Flight Operations System software build		<u>Completed 2/17/17</u>
	22 Delivery of sunshield extension boom #2 membrane attachment assembly to Observatory I&T		<u>Completed 4/24/17</u>

Blue font(underline) denotes milestones accomplished ahead of schedule, orange font denotes milestones accomplished late. "\*" denotes 2016 milestones carried forward.

# Fiscal Year 2017 JWST HQ Milestones

Month	Milestone	FY2016 Deferral	Comment
Apr-17	23 Conduct first test of the Ground System (communications and data handling)		Completed 6/20/17
	24 Install the deployable horizontal radiators onto the Observatory		Delayed to <u>October</u> for delays arising from release device installation
	25 Conduct the Observatory Deployment Review #2		Completed 6/13/17
May-17	26 Complete room temperature integration of OTIS and test equipment at JSC		Completed 7/13/17
	27 Conduct the Mission Operations Review		<u>Completed 4/7/17</u>
	28 Perform Spacecraft Acoustic Testing		Delayed to <u>October</u> for delays in spacecraft and sunshield I&T
Jun-17	29 Start OTIS thermal vacuum test At JSC Chamber A		Completed 7/13/17
	30 Deliver Operations Scripts Subsystem software build that supports launch		<u>Completed 3/30/17</u>
	31 Issue final release of call for proposals for Early Release Science Programs		<u>Completed 5/19/17</u>
	32 Begin spacecraft thermal vacuum test		Delayed to <u>December</u> for delays in spacecraft and sunshield I&T
Jul-17	33 Deliver vibration test results to support the combined analysis of the rocket and the observatory		Delayed to <u>December</u> for delays in spacecraft and sunshield I&T
	34 Conduct second Flight Operations Team Operational Readiness Exercise		<u>Completed 6/29/17</u>
Aug-17	35 Tension sunshield membranes while they are mounted on the spacecraft		Delayed to <u>February</u> for delays in spacecraft and sunshield I&T
	36 Deliver final report describing spacecraft influence on observatory optical alignment		Delayed to <u>October</u> for later OTIS test start
Sep-17	37 Complete OTIS thermal vacuum test		Delayed to <u>October</u> due to post environmental testing
	38 Deliver the results of the combined analysis of the rocket and the observatory		Delayed to <u>October</u> due to later completion of spacecraft element
Blue font( <u>underline</u> ) denotes milestones accomplished ahead of schedule, orange font denotes milestones accomplished late. "*" denotes 2016 milestones carried forward.			

# SUMMARY

- Program remains within replan budget, now planning for late Spring 2019 launch readiness date
- Science payload testing is almost complete, OTIS shipping to Northrop in December
- Remaining challenges will be in maintaining schedule during complex deployment and environmental testing of spacecraft and Observatory



# JAMES WEBB SPACE TELESCOPE

## Science and Operations Center (S&OC) Update



STScI



Nikole K. Lewis  
STScI JWST Project Scientist  
2017 October 18

# Recent Key JWST S&OC Events

- S&OC Release 2 Verified and Delivered, on track for timely delivery of flight build.
- JWST Cycle 1 Science Program Specifications/Proposals (GTO and DD ERS) solicited and received.
- Continued support of astronomical and public engagement and growth of JWST user support infrastructure



JWST MOC

# The JWST Director's Discretionary Early Release Science (DD ERS) Program

*STScI Director Ken Sembach will allocate ~500 hours of Director's Discretionary time for Early Release Science (DD-ERS) to*

- *accelerate the diffusion of JWST know-how, and*
- *expand early opportunities for the community to gain experience with JWST data and scientific analysis.*

*Early resources are allocated to support up to 15 teams. Proposals will be selected in research areas spanning the science themes of JWST :*



*First Light &  
Reionization*



*Assembly of  
Galaxies*



*Birth of Stars &  
Protoplanetary  
Systems*

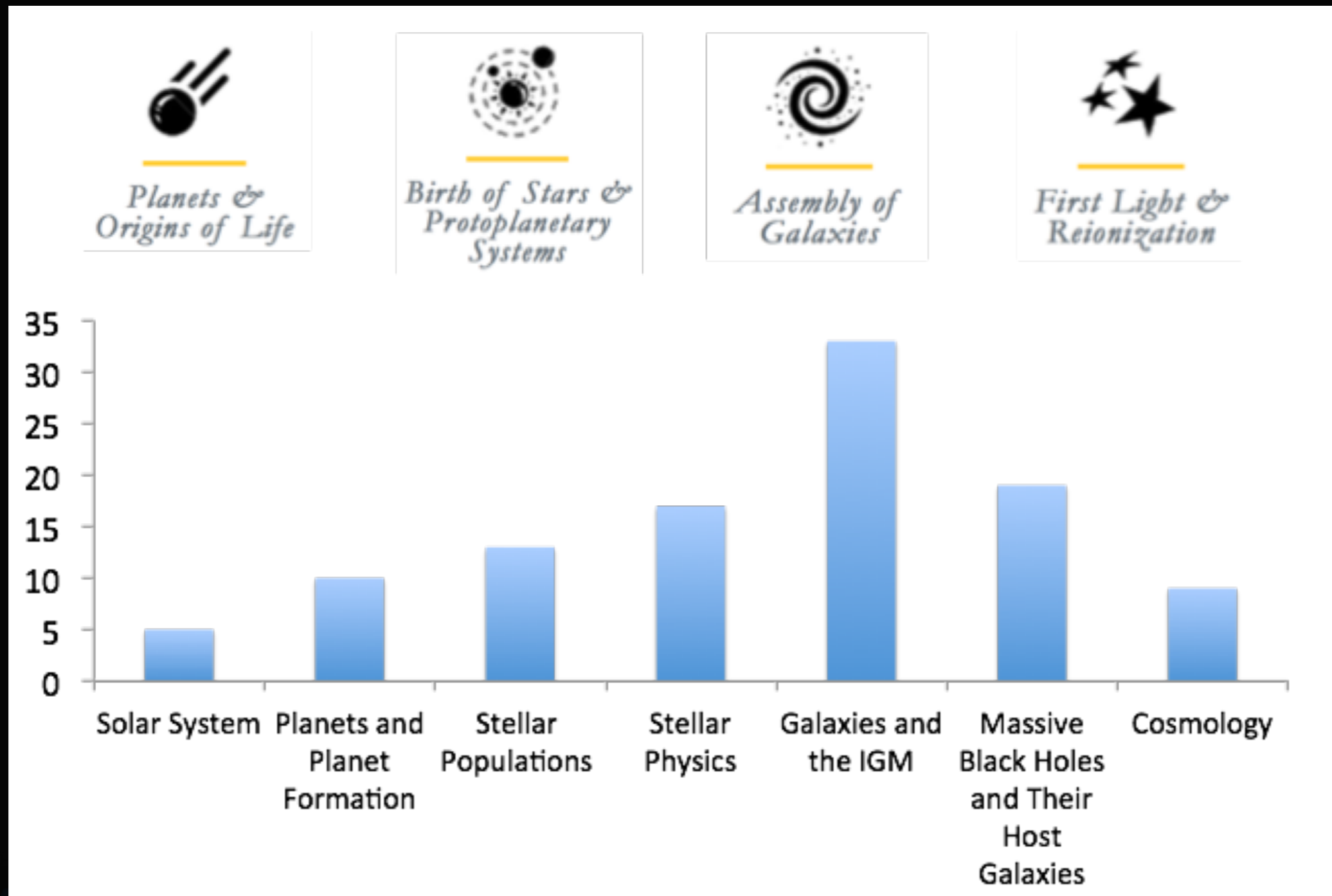


*Planets & Origins  
of Life*



106 proposals to Director's Discretionary Early Release Science (DD ERS) program received! TAC met in early October 2017. Results announced November 2017.

# The JWST Director's Discretionary Early Release Science (DD ERS) Program



TAC convened as four panels (2 Galactic and 2 Extragalactic)  
No fixed quota for proposal selection from each panel



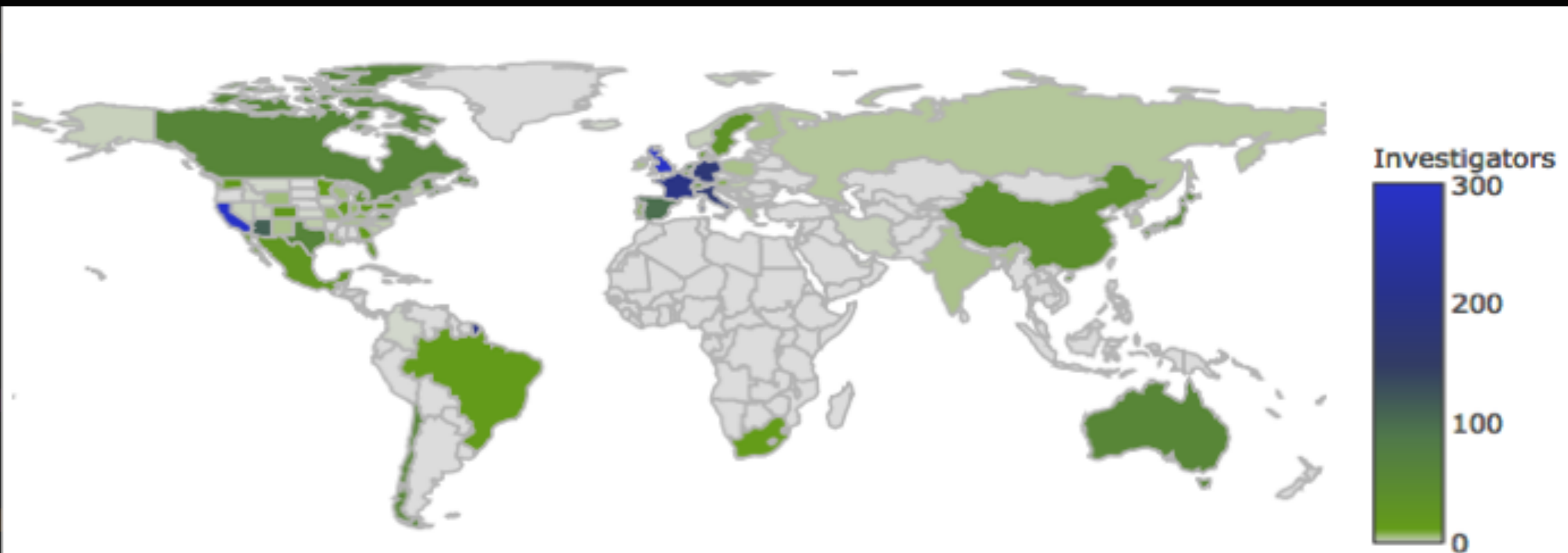
# The JWST Director's Discretionary Early Release Science (DD ERS) Program

<b>Instrument</b>	<b>Instrument Prime Usage</b>	<b>Instrument Prime + Coordinated Parallel Usage</b>
MIRI	31.3%	30.0%
NIRCam	29.8%	33.0%
NIRISS	3.8%	5.6%
NIRSpec	35.1%	31.4%
	100%	100%

Wide Range of Observing Modes Requested!

# The JWST Director's Discretionary Early Release Science (DD ERS) Program

Principal Investigators (PI) and Co-Principal Investigators (Co-PI) are based in 15 countries, with representation including Co-Investigators (Co-I) and Collaborators from 38 countries, 43 U.S. states, and 1 U.S. territory. Average 28 scientists per team (largest team had 138 members)



# JWST Calls for Proposals

<https://jwst-docs.stsci.edu/display/JSP/JWST+Cycle+1+Proposal+Opportunities>

JWST Opportunities and Policies

## JWST Cycle 1 Proposal Opportunities

The James Webb Space Telescope will offer proposal opportunities for General Observers (GTO), and Early Release Science Programs (DD ERS) during JWST Cycle 1 observations will commence in Spring 2019, with Cycle 1 proposals due in 2017/2018.

We invite scientists to participate in the first cycle of investigations with the James Webb Space Telescope (JWST). JWST is an international collaboration between NASA, the European Space Agency (ESA), and the Canadian Space Agency (CSA). JWST is operated and managed by the Space Telescope Science Institute (STScI). The links below provide information, policies and instructions for proposing opportunities with JWST in Cycle 1.

- [General Observer \(GO\) and Archival Research \(AR\) Program \[PDF\]](#)
- [Director's Discretionary Early Release Science \(DD ERS\) Program](#)
  - [Call for Notices of Intent to propose](#)
  - [Call for Proposals \[PDF\]](#)
- [Guaranteed Time Observation \(GTO\) Program \[PDF\]](#)

## Important Dates

Rows are color coded by opportunity, where red = GTO, green = DD ERS, and white = Cycle 1 GO

Release of the Cycle 1 Call for GTO Proposals	January 6, 2017
Release of the Cycle 1 Call for DD ERS Notices of Intent	January 6, 2017
DD ERS Letters of Intent due	March 3, 2017, 8pm ET
Cycle 1 GTO Science Descriptions and Observation Specifications due	April 1, 2017, 8pm ET
Release of the Cycle 1 Call for DD ERS Proposals	May 19, 2017
APT version 25.1 Released (with updated Cycle 1 overhead calculations)	June 1, 2017
GTO Observation Specifications Published (public)	June 15, 2017
APT version 25.2 Released (primarily HST updates)	June 21, 2017
GTO APT Technical Reviews and Revisions Begin	July 28, 2017
DD ERS Proposal Deadline	August 18, 2017, 8pm ET
DD ERS Results Released	November 2017
GTO APT Technical Reviews and Revisions Completed	November 15, 2017
APT version 25.4 Released (further updates for Cycle 1 GO Call)	November 20, 2017
Submissions of GTO APT proposals completed	November 30, 2017
Release of the Cycle 1 Call for GO Proposals	November 30, 2017
Formal DD ERS Budget Proposals	Early December 2017
GTO APT Files advertised (public)	December 15, 2017
DD ERS APT Files advertised (public)	December 2017
Cycle 1 GO Proposal Deadline	March 2, 2018

[jwst-docs.stsci.edu](http://jwst-docs.stsci.edu) -> More than 500 articles published!

# User Tools Supporting DD ERS

APT 25.2

<http://apt.stsci.edu>

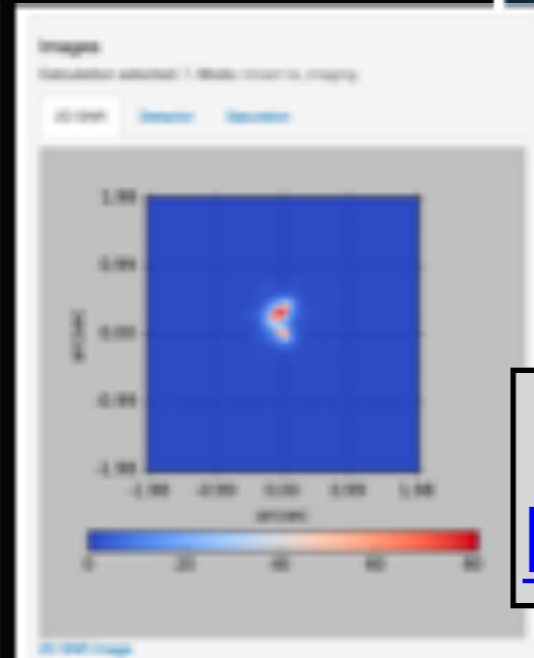
Astronomer's Proposal Tools  
version 25



ETC WebApp

<https://jwst.etc.stsci.edu>

JWST ETC



STScI | JWST Help Desk

JWST Help Desk Portal

<https://jwsthelp.stsci.edu>

Welcome to the James Webb  
Space Telescope Help Desk



Request a MyST Account

Please register to gain full access to the James Webb Space Telescope Help Desk. Without an account you may still search the knowledge base but you will not be able to submit requests or questions.



NASA's James Webb Space Telescope

Developed in partnership with ESA and CSA. Operated by AURA's Space Telescope Science Institute

JWST SCIENCE

NEWS & EVENTS

INSTRUMENTATION

SCIENCE PLANNING

DOCUMENTATION







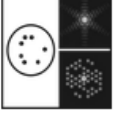
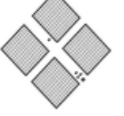







JWST Observer Website

<https://jwst.stsci.edu/>

# JWST Help Desk

James Webb Help Desk

<b>APT Support</b>  Request assistance with the Astronomer's Proposal Tool (APT) <a href="#">View Details</a>	<b>ETC Support</b>  Request assistance with the Exposure Time Calculator (ETC) <a href="#">View Details</a>	<b>JWST Science Policies</b>  Request assistance for Science Policy Issues. <a href="#">View Details</a>
<b>MAST Services</b>  Information about the MAST Archive <a href="#">View Details</a>	<b>MIRI Support</b>  Request assistance with the Mid-Infrared Instrument (MIRI) <a href="#">View Details</a>	<b>NIRCam Support</b>  Request assistance with the Near-Infrared Camera (NIRCam) <a href="#">View Details</a>
<b>NIRISS Support</b>  Request assistance with the Near-Infrared Imager and Slitless Spectrograph (NIRISS) <a href="#">View Details</a>	<b>NIRSpec Support</b>  Request assistance with the Near-Infrared Spectrograph (NIRSpec) <a href="#">View Details</a>	<b>Office of Public Outreach</b>  Contact the STScI Office of Public Outreach about JWST <a href="#">View Details</a>
<b>Operations and Scheduling</b>  Ask questions about scheduling and operations with JWST. <a href="#">View Details</a>	<b>Pipeline Support</b>  Request assistance with the JWST pipeline <a href="#">View Details</a>	<b>WebbPSF / JWST Telescope</b>  Request assistance with the WebbPSF tool or the Telescope optical system. <a href="#">View Details</a>
<b>JWST General Support</b>  Request general JWST support for issues not covered by another category. <a href="#">View Details</a>		

## Welcome to the James Webb Space Telescope Help Desk

[jwsthelphelp.stsci.edu](http://jwsthelphelp.stsci.edu)

100+ help tickets received and resolved in week before DD ERS deadline

## How can we help?

Search JWST Knowledge Base and Documentation System (JDOX)

How can we help?



**Knowledge Base**

Browse and search JWST Knowledge Base and Documentation (JDOX)



**Get Help**

Contact support to make a request, or report a problem



**Community Forum**

Community-sourced answers to your questions

# Online Resources

## NASA's James Webb Space Telescope

Developed in partnership with ESA and CSA. Operated by AURA's Space Telescope Science Institute

PUBLIC

EDUCATORS

JWST SCIENCE

NEWS & EVENTS

**INSTRUMENTATION**

SCIENCE PLANNING

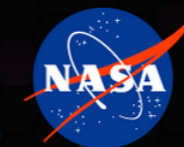
DOCUMENTATION



For the astronomical community



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The NASA James Webb Space Telescope, developed in partnership with ESA and CSA, is operated by AURA's Space Telescope Science Institute.

[jwst.stsci.edu](http://jwst.stsci.edu)

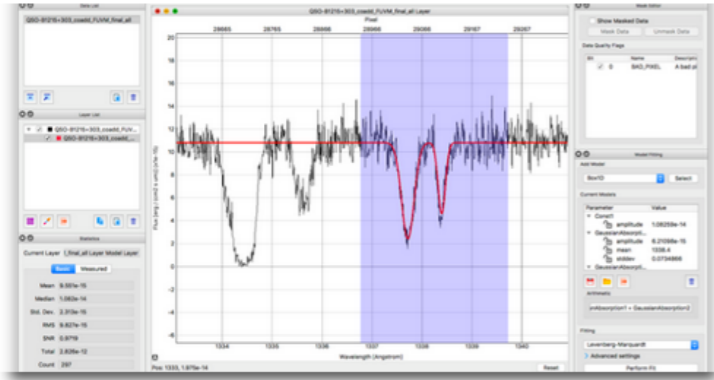
# JWST Observer News & Events

Manage Subscription Options: [profile.stsci.edu](https://profile.stsci.edu)



Distributed via e-mail. Overview of JWST Observer News and Events ([jwst.stsci.edu/news-events/news](https://jwst.stsci.edu/news-events/news))

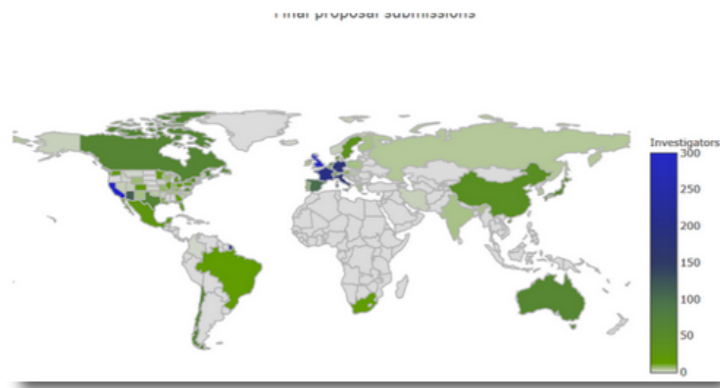
# JWST Observer News



## James Webb Data Analysis Development Forum Releases SpecViz Version 0.4.0

News Feature • August 29, 2017

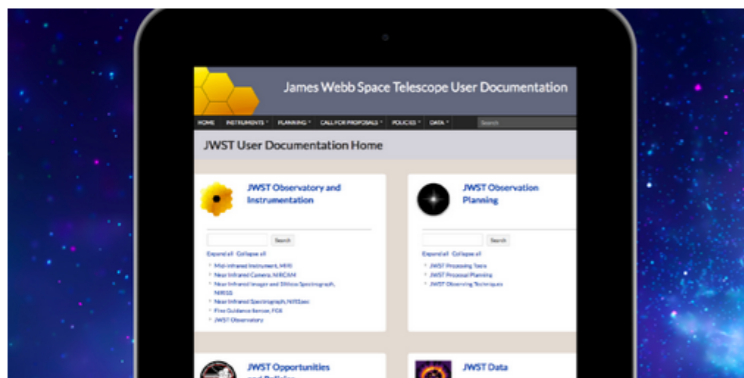
STScI is developing SpecViz, a one-dimensional astronomical spectral visualization and analysis suite, to support all types of astronomical spectral data.



## DD-ERS Proposal Submission Statistics Are Now Available

News Feature • August 28, 2017

With the submission of the final proposals for the Director's Discretionary Early Release Science (DD-ERS) Program, we're ready to get started planning for the early observation cycle.



## JWST User Documentation Keeps the Community Well-informed

News Feature • August 14, 2017

JWST User Documentation (JDox) provides the astronomical community with a Wikipedia-styled site to keep users informed about JWST instruments, proposals, and more.

[jwst.stsci.edu/news-events/news](http://jwst.stsci.edu/news-events/news)





# JWST Observer Workshops & Webinars

Subscribe to Events: [RSS](#) [ICS](#) [UPCOMING](#) [PAST](#)

## This Month (October)

4						
Oct 2017						
Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7

### JWST ESAC Workshop - Mastering the Science Instruments and the Observing Modes of JWST: Get Set

Training Workshop • October 4 - 6, 2017 • ESAC, Madrid, Spain

The European Space Agency is sponsoring this JWST proposal preparation workshop, which will be held at ESAC, near Madrid, Spain. The 2.5 day workshop is scheduled to take place a few weeks before the JWST Cycle 1 call for General Observer (GO) proposals. Prospective JWST users will gain hands-on experience with various tools that support the development and submission of proposals. Tools include, but...

15						
Oct 2017						
Su	Mo	Tu	We	Th	Fr	Sa
15	16	17	18	19	20	21

### JWST at the 49th Annual Division for Planetary Sciences Meeting

Science Meeting • October 15 - 20, 2017 • Provo, UT

The James Webb Space Telescope will be a major highlight in the program of the 49th Annual Division for Planetary Sciences Meeting, which is going to be held at the Utah Valley Convention Center in Provo, UT. The meeting will help potential JWST observers of So...

More than a dozen in person workshops and two dozen webinars supported in 2017!

## Workshops & Lectures

Use the links below to learn about JWST workshops and lectures to prepare you for the ERS and GO Cycle 1 proposal deadlines and the overall JWST mission.

**WORKSHOPS** ↻

**COMMUNITY LECTURE SERIES** ↻

Workshops and Webinar Recordings and Materials Archived Online

# JWST User Committees

## User Committees

In this area, you can find information about various JWST committees.

**JWST ADVISORY COMMITTEE  
(JSTAC) ☉**

**JWST USERS COMMITTEE (JSTUC) ☉**

**JWST SCIENCE WORKING GROUP  
(SWG) ☉**

Final Meeting of  
JSTAC took place in  
July 2017

SWG continues  
regular activities

First Meeting of  
JSTUC took place in  
September 2017

# JWST User Committee (JSTUC)

NEWS & EVENTS > EVENTS THE 1ST MEETING...

## Event Assets

[Agenda](#)

Add to Calendar:

### The 1st Meeting of the JWST Users Committee (JSTUC)

September 14 - 15, 2017  
STScI Baltimore, MD

The 1st meeting of the JSTUC was held at STScI on September 14-15, 2017. The committee was welcomed by the STScI Director, the JWST Senior Project Scientist, and representatives of the three space agencies. The committee received briefings on all aspects of the JWST program, including progress on the testing being completed at Johnson Space Center and the ongoing preparations at STScI and GSFC to support community science. The JSTUC will meet semi-annually to provide user advice to the observatory. More information is available on the [JSTUC](#) page.

### Meeting Agenda

The JSTUC members met on Wednesday evening for a reception and tour of the JWST Mission Operations Center.

#### Thursday, September 14, 2017

Time	Topic	Presenter
8:15-8:30	Breakfast @ Rotunda	
8:30-9:00	Welcome & STScI Status	K. Sembach
9:00-9:30	<u>Welcome &amp; GSFC Status</u> - SWG update	J. Mather
9:30-10:15	<u>JWST Project Report</u> - JWST test updates	W. Ochs
10:15-11:00	<u>JWST Mission Office Report</u> - SOC status	M. Stiavelli/N. Lewis

Name	Institution
<a href="#">James Bullock</a> <input type="checkbox"/>	University of California, Irvine
<a href="#">Kat Barger</a> <input type="checkbox"/>	Texas Christian University
<a href="#">Natalie Batalha</a> <input type="checkbox"/>	NASA-Ames
<a href="#">Saida Caballero-Nieves</a> <input type="checkbox"/>	Florida Institute of Technology
<a href="#">Stephane Charlot</a> <input type="checkbox"/>	Institute d'Astrophysics, Paris
<a href="#">Duncan Farrah</a> <input type="checkbox"/>	Virginia Polytechnic Institute and State University
<a href="#">Tom Greene</a> <input type="checkbox"/>	NASA-Ames
<a href="#">Amanda Hendrix</a> <input type="checkbox"/>	Planetary Science Institute
<a href="#">Kelsey Johnson</a> <input type="checkbox"/>	University of Virginia
<a href="#">Heather Knutson</a> <input type="checkbox"/>	California Institute of Technology
<a href="#">David Lafreniere</a> <input type="checkbox"/>	Universite de Montreal
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