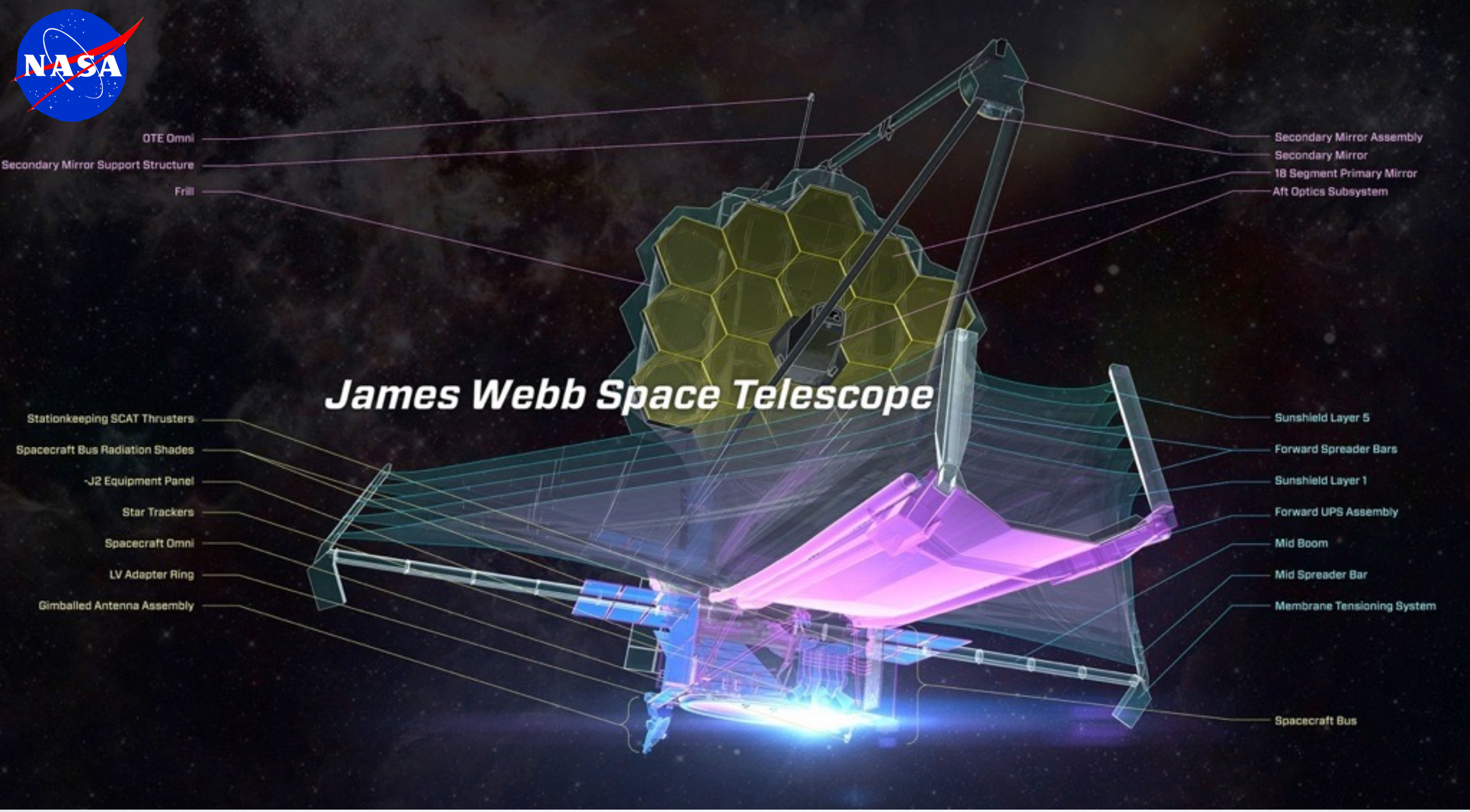
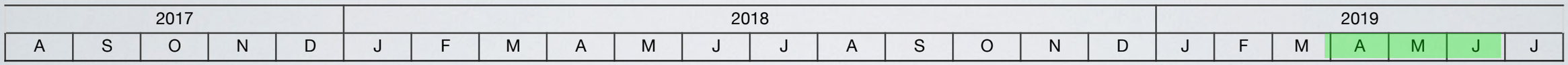


October 18, 2017

Eric P. Smith
JWST Program Director/Program Scientist

SIMPLIFIED SCHEDULE



launch period

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

Spacecraft Integration and Test

Observatory Integration and Test

1

Observatory

OTIS = Optical Telescope + ISIM

OTIS

3

Science Payload

12

Development, Testing, Release

Ground System

Northrop-Grumman

Johnson Space Center

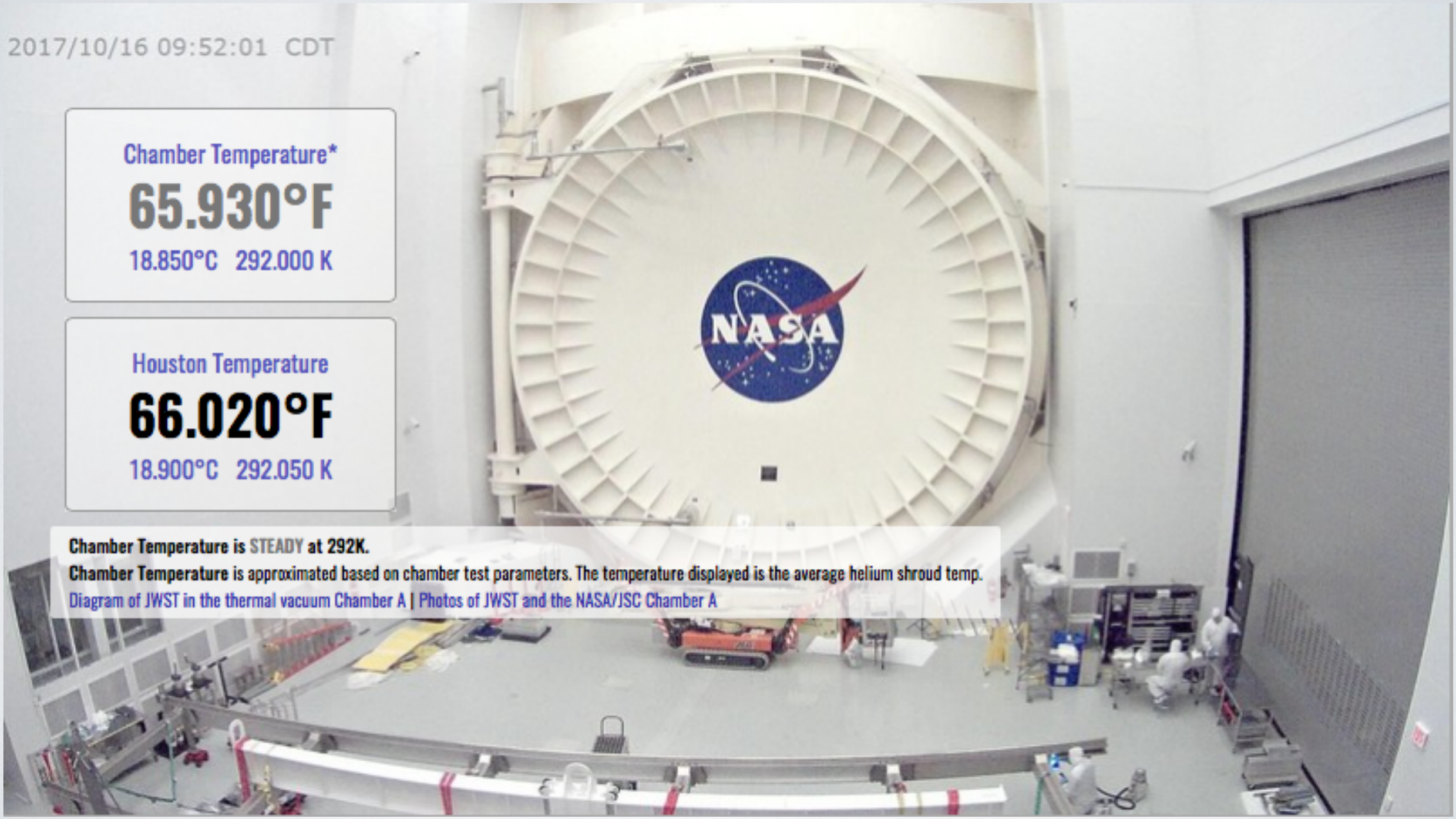
Guiana Space Center

Space Telescope Science Institute

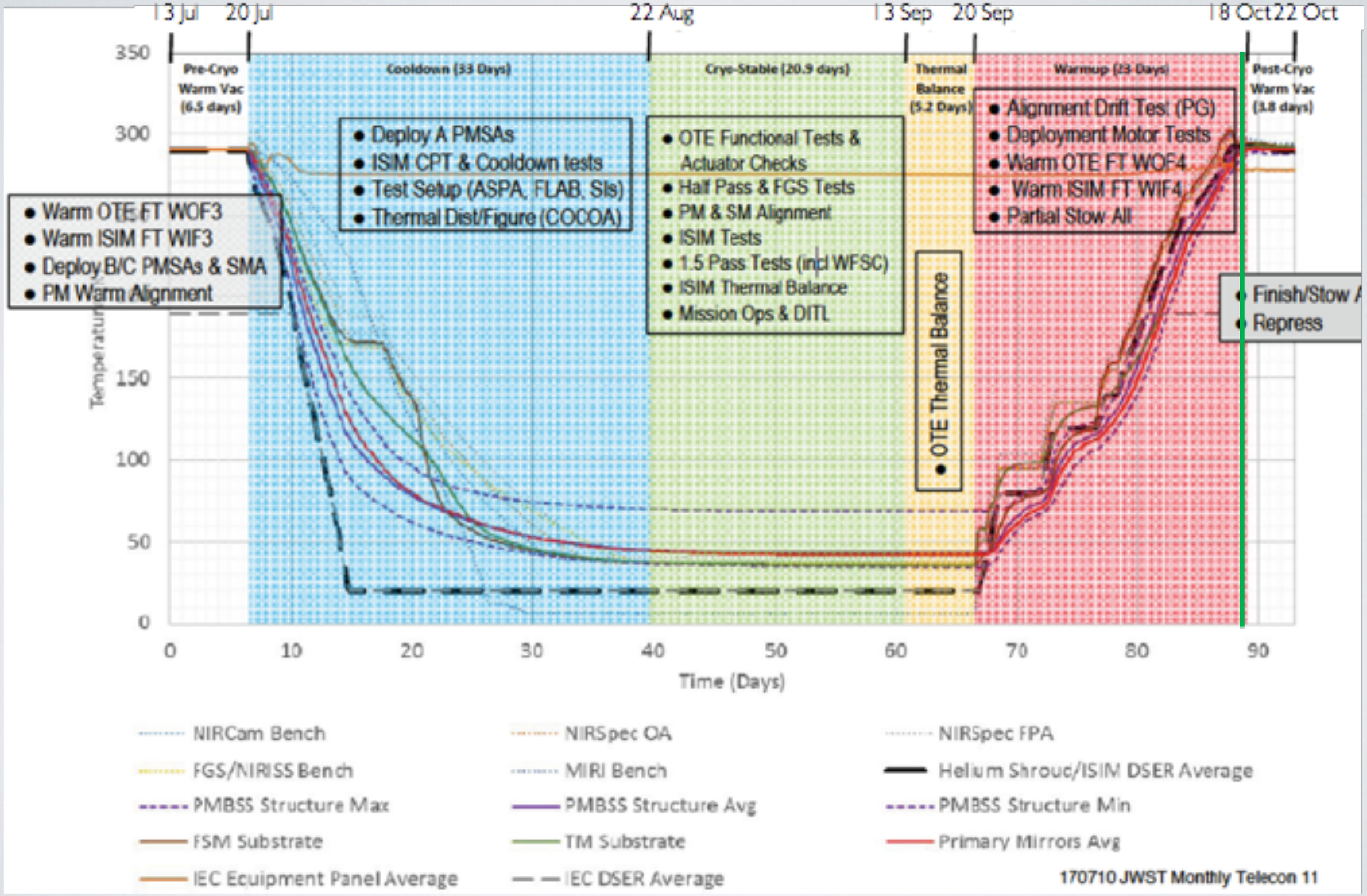
S&OC SUBSYSTEMS

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		

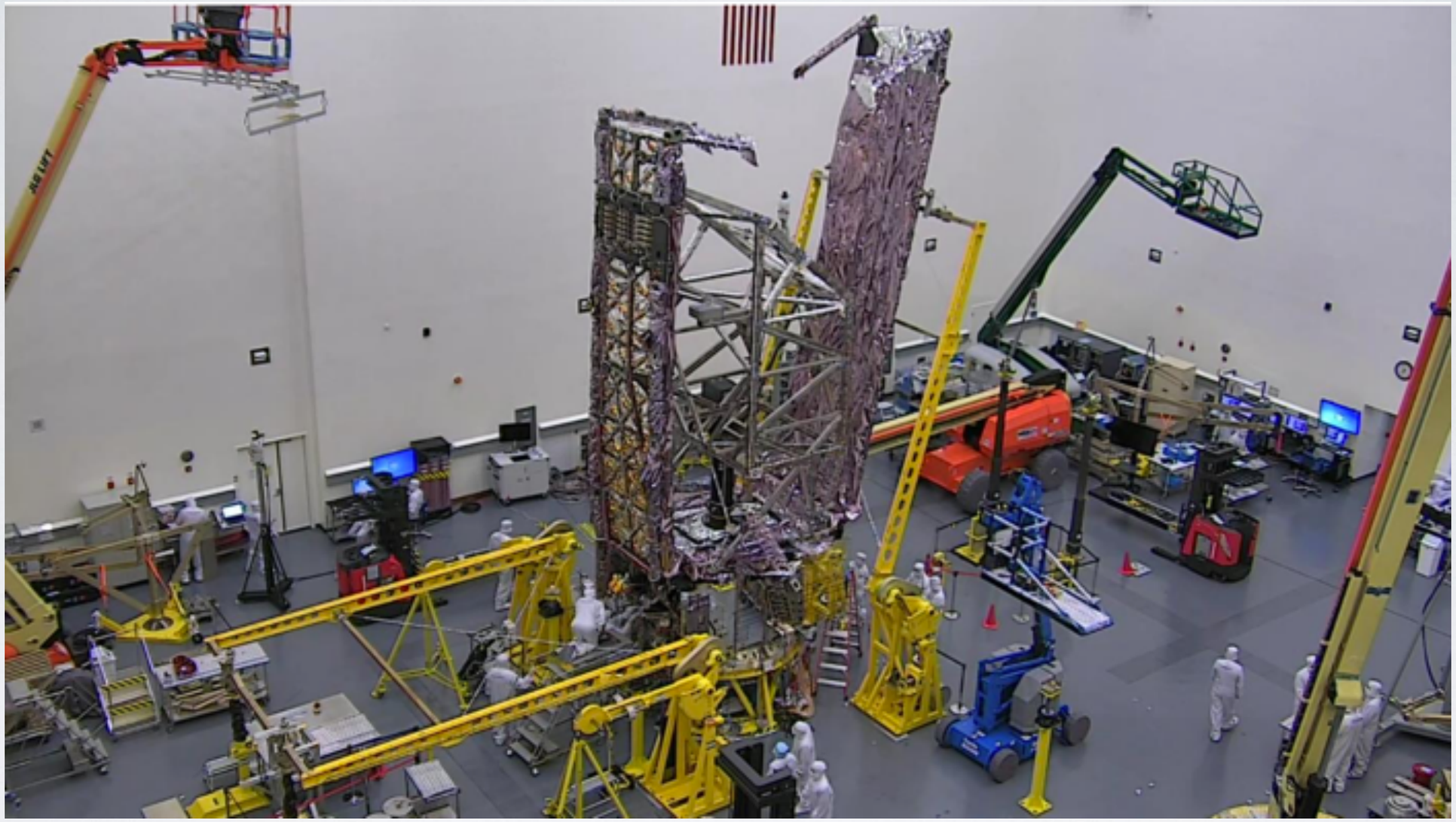
OTIS


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

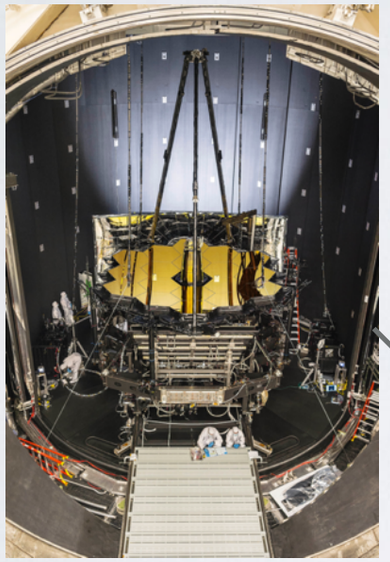
DEPLOYMENT TESTING

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

REMAINING ACTIVITIES

☑OTIS Cryovacuum testing

•OTIS Deployments at NGAS



☑Spacecraft Integration

☑Sunshield (SS) Skeleton Deployments

☑SS 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

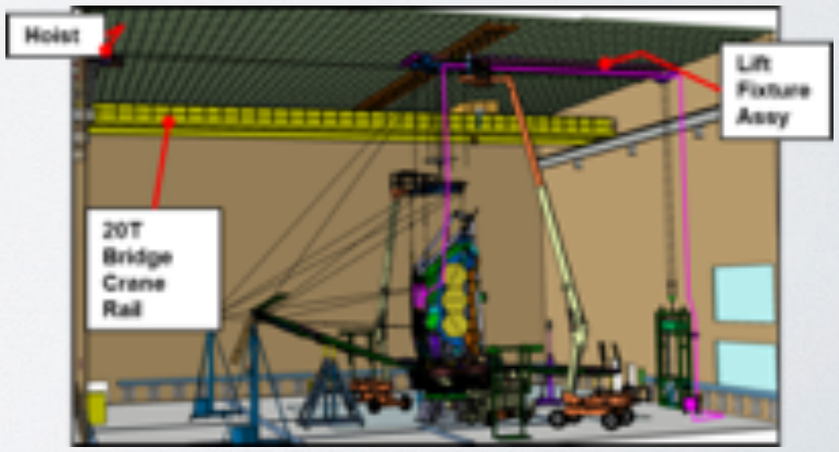
Observatory Integration

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

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 October 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		Completed 4/7/17
	28	Perform Spacecraft Acoustic Testing		Delayed to October 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		Completed 3/30/17
	31	Issue final release of call for proposals for Early Release Science Programs		Completed 5/19/17
	32	Begin spacecraft thermal vacuum test		Delayed to December 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 December for delays in spacecraft and sunshield I&T
	34	Conduct second Flight Operations Team Operational Readiness Exercise		Completed 6/29/17
Aug-17	35	Tension sunshield membranes while they are mounted on the spacecraft		Delayed to February for delays in spacecraft and sunshield I&T
	36	Deliver final report describing spacecraft influence on observatory optical alignment		Delayed to October for later OTIS test start
Sep-17	37	Complete OTIS thermal vacuum test		Delayed to October due to post environmental testing
	38	Deliver the results of the combined analysis of the rocket and the observatory		Delayed to October due to later completion of spacecraft element

Blue font(underline) 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

Nikole K. Lewis
STScI JWST Project Scientist
2017 October 18

Recent Key JWST S&OC Events

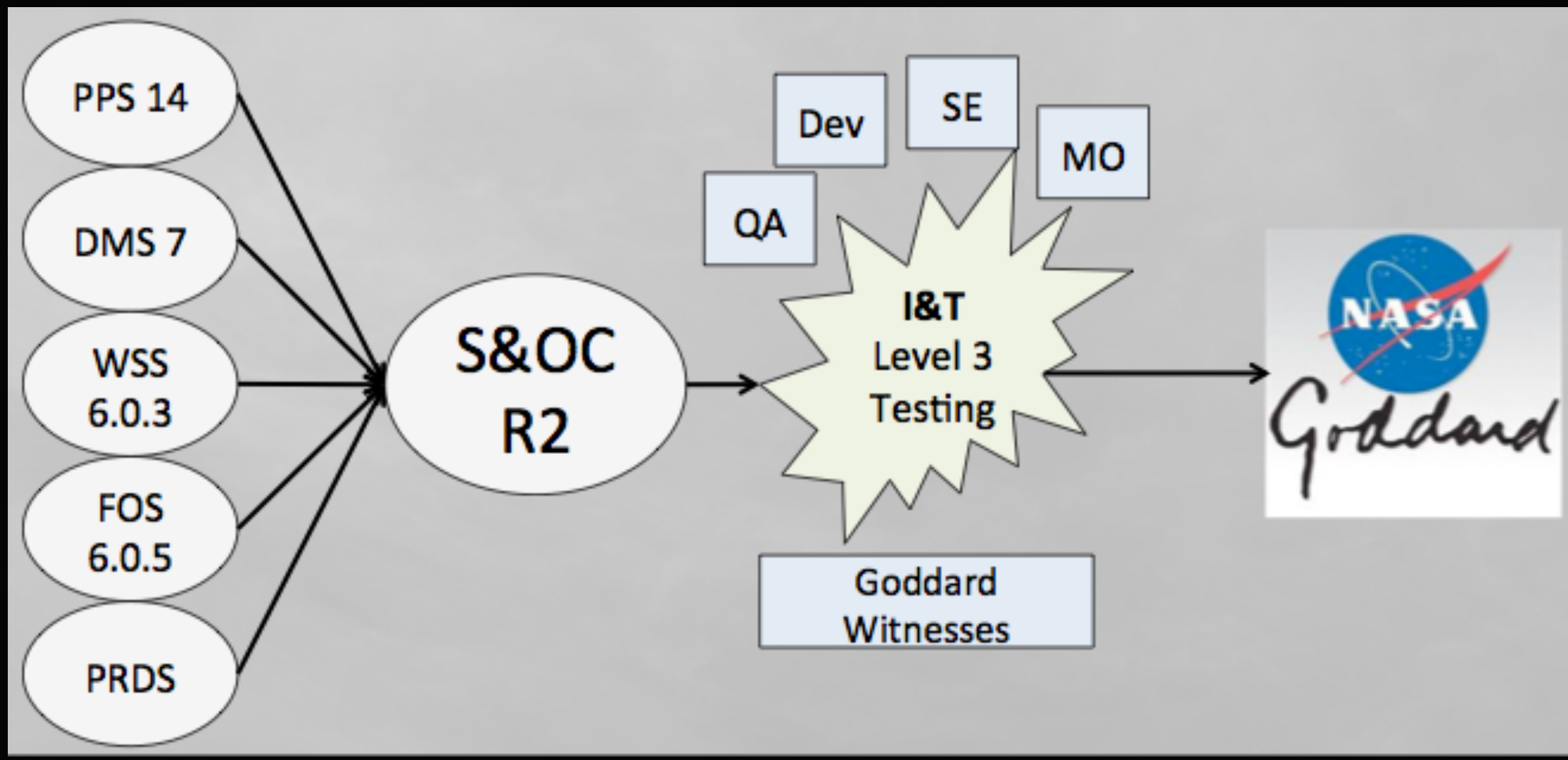
- S&OC Release 2 Verified and Delivered, on track for timely delivery of flight build.

- 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

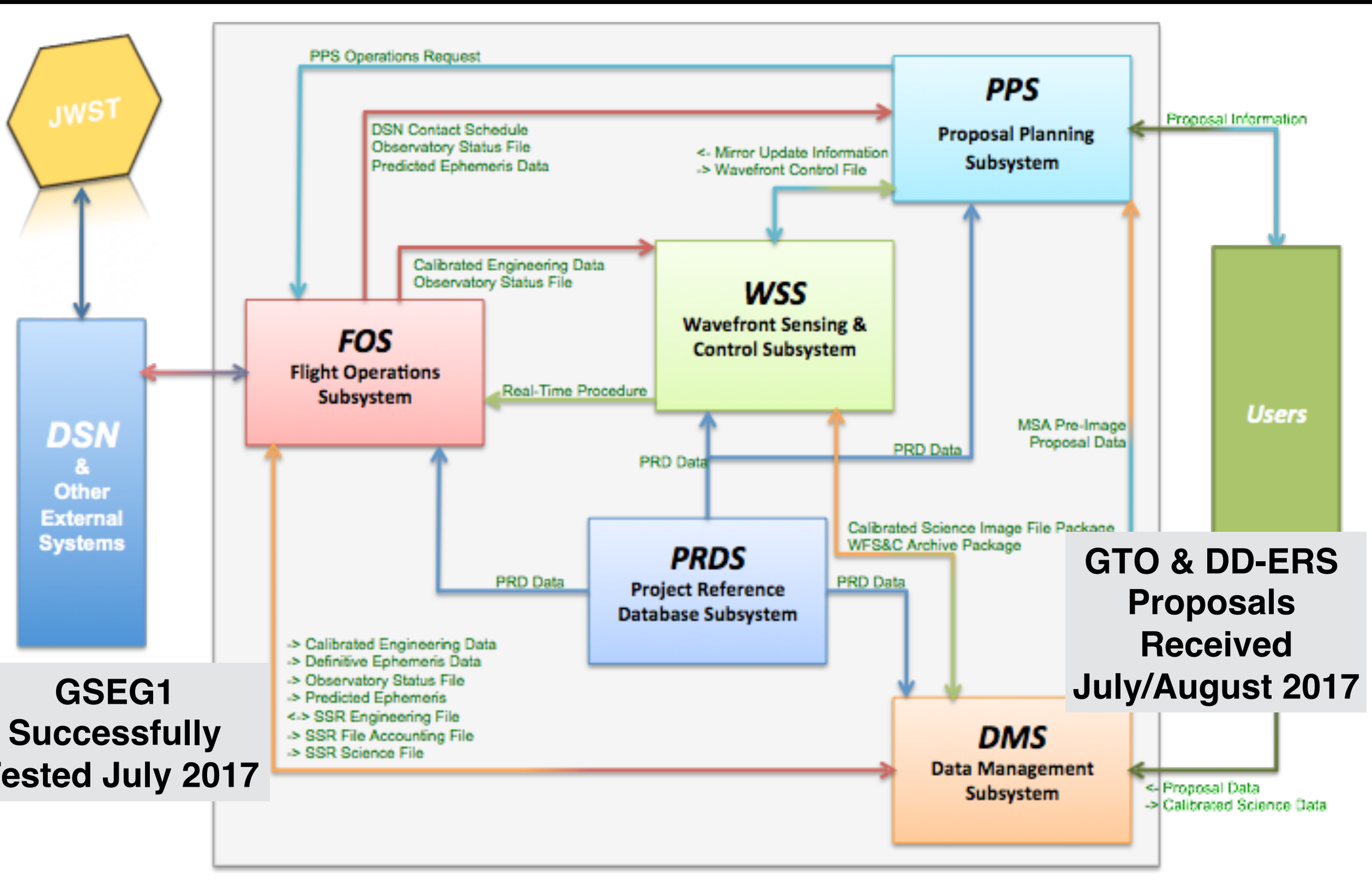
JWST MOC

S&OC Release 2



More than 100 S&OC requirements verified!

S&OC Release 2



GSEG1 Successfully Tested July 2017

GTO & DD-ERS Proposals Received July/August 2017

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

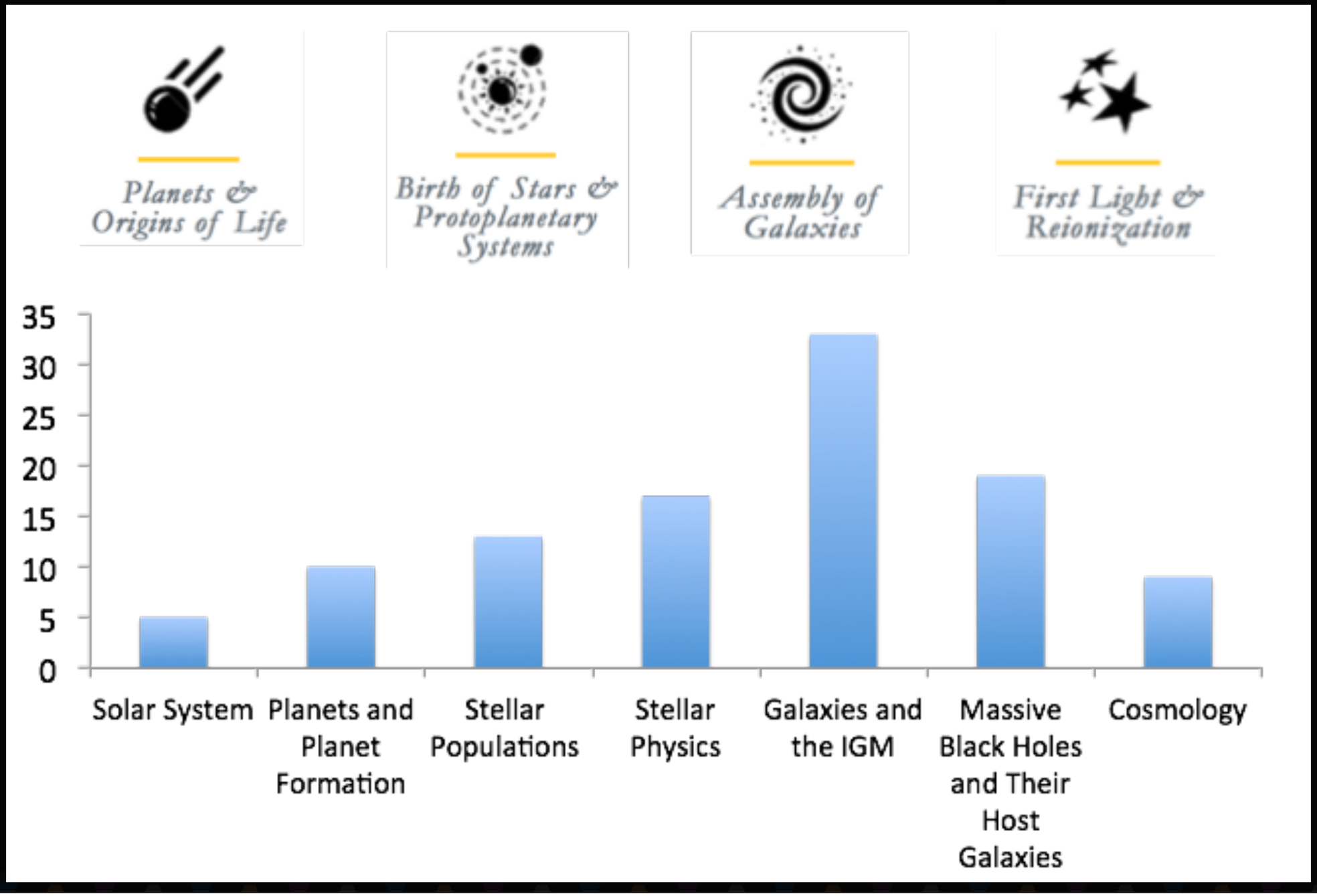
- ***accelerate the diffusion of JWST know-how, and***
- ***expand early opportunities for the community to gain experience with JWST data and scientific analysis.***

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

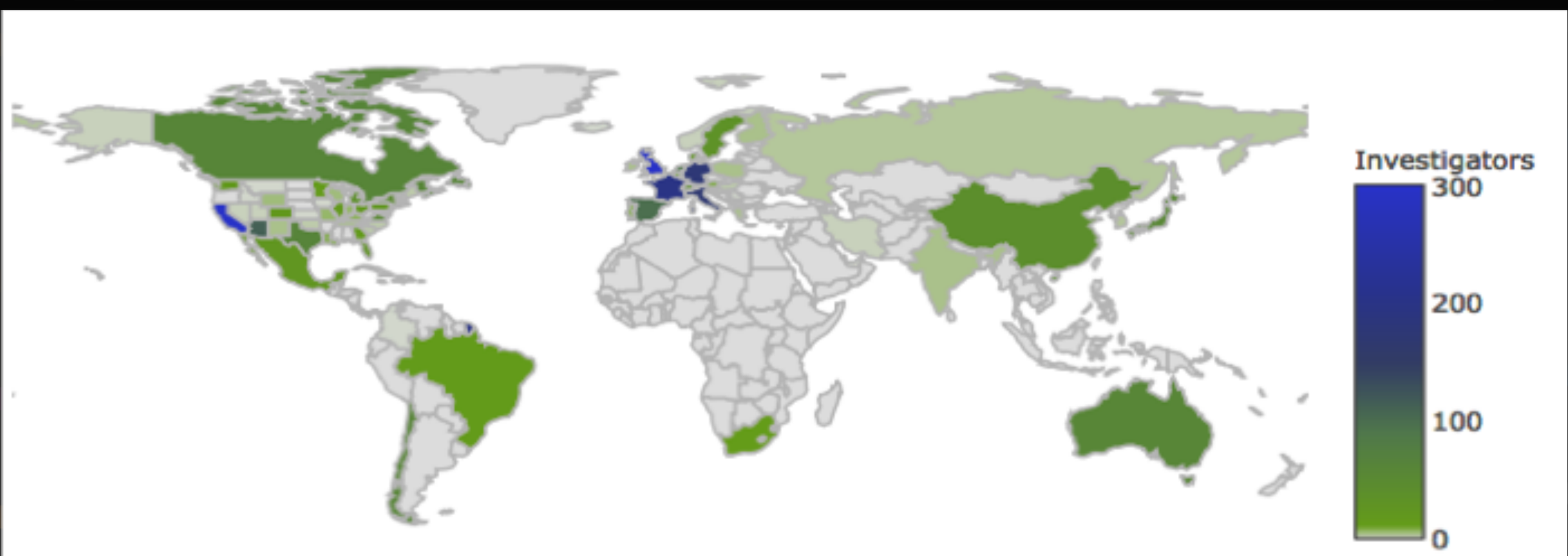
The JWST Director's Discretionary Early Release Science (DD ERS) Program

Instrument	Instrument Prime Usage	Instrument Prime + Coordinated Parallel Usage
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)



https://jwst.stsci.edu/news-events/news/News%20items/dd-ers-proposal-submission-statistics-are-now-available

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 Observ
Guaranteed-Time Observers (GTO), and Early Release Science Programs (DD ERS) duri
JWST Cycle 1 observations will commence in Spring 2019, with Cycle 1 proposals deac
2017/2018.

We invite scientists to participate in the first cycle of investigations with the James We
Telescope (JWST). JWST is an international collaboration between NASA, the Europeai
Agency (ESA), and the Canadian Space Agency (CSA). JWST is operated and managed b
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

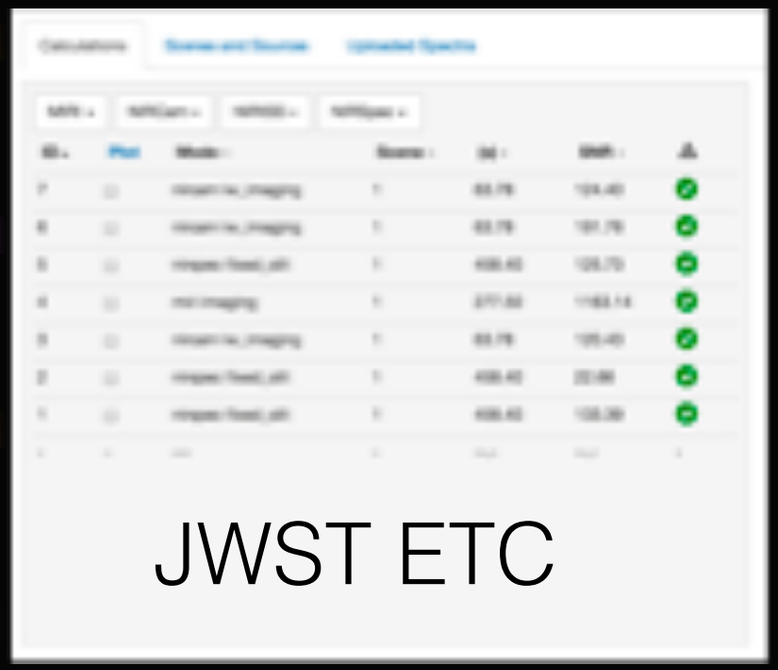
Rows are color coded by opportunity, where red = GTO, green = DD ERS, and white = Cycle 1 GO

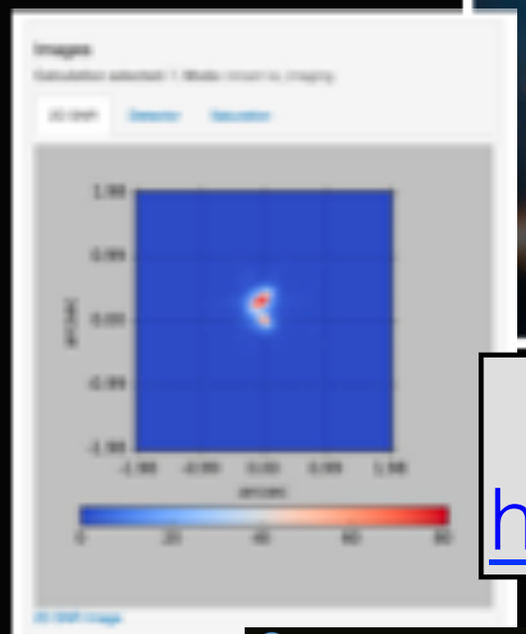
Release of the Cycle 1 Call for GTO Proposals	January 6, 2017
Release of the Cycle 1 Call for DD ERS Notices of Intent	January 6, 2017
DD ERS Letters of Intent due	March 3, 2017, 8pm ET
Cycle 1 GTO Science Descriptions and Observation Specifications due	April 1, 2017, 8pm ET
Release of the Cycle 1 Call 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 -> More than 500 articles published!

User Tools Supporting DD ERS

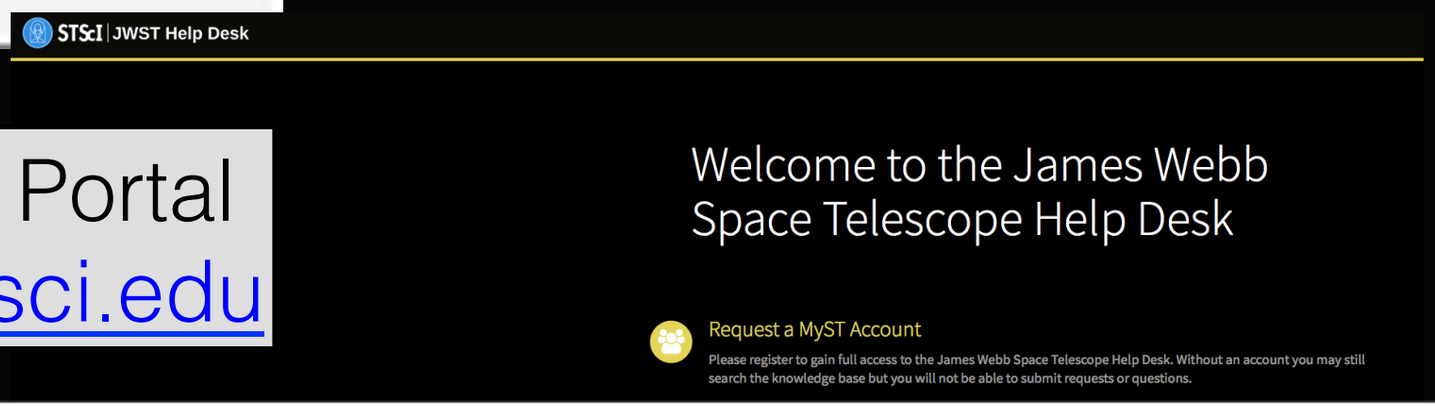
APT 25.2
http://apt.stsci.edu


JWST ETC

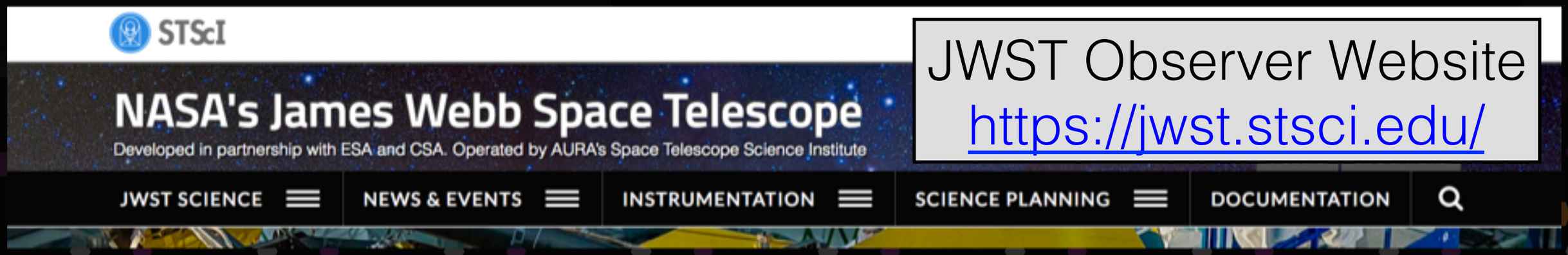


ETC WebApp
https://jwst.etc.stsci.edu

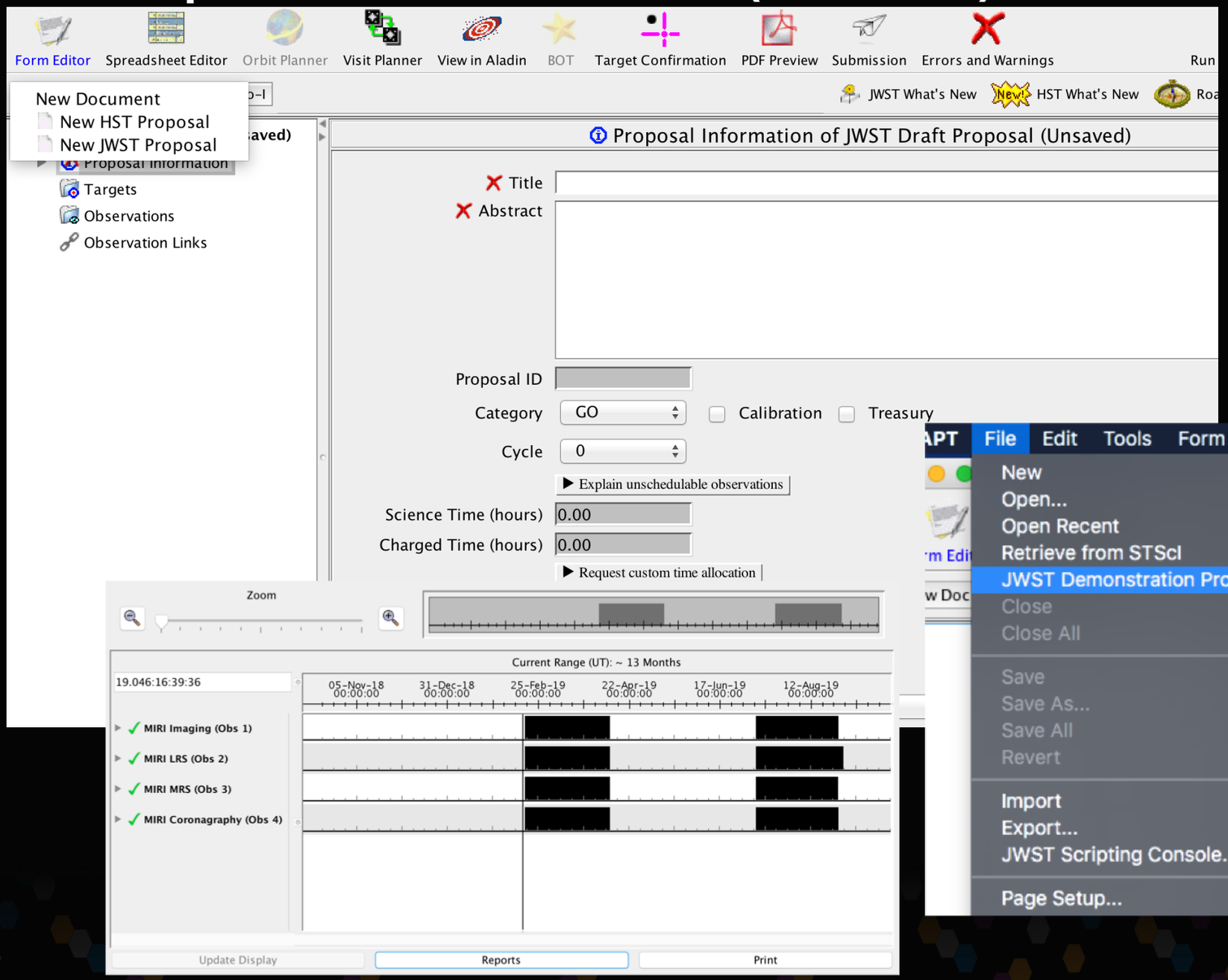
JWST Help Desk Portal
https://jwsthelp.stsci.edu

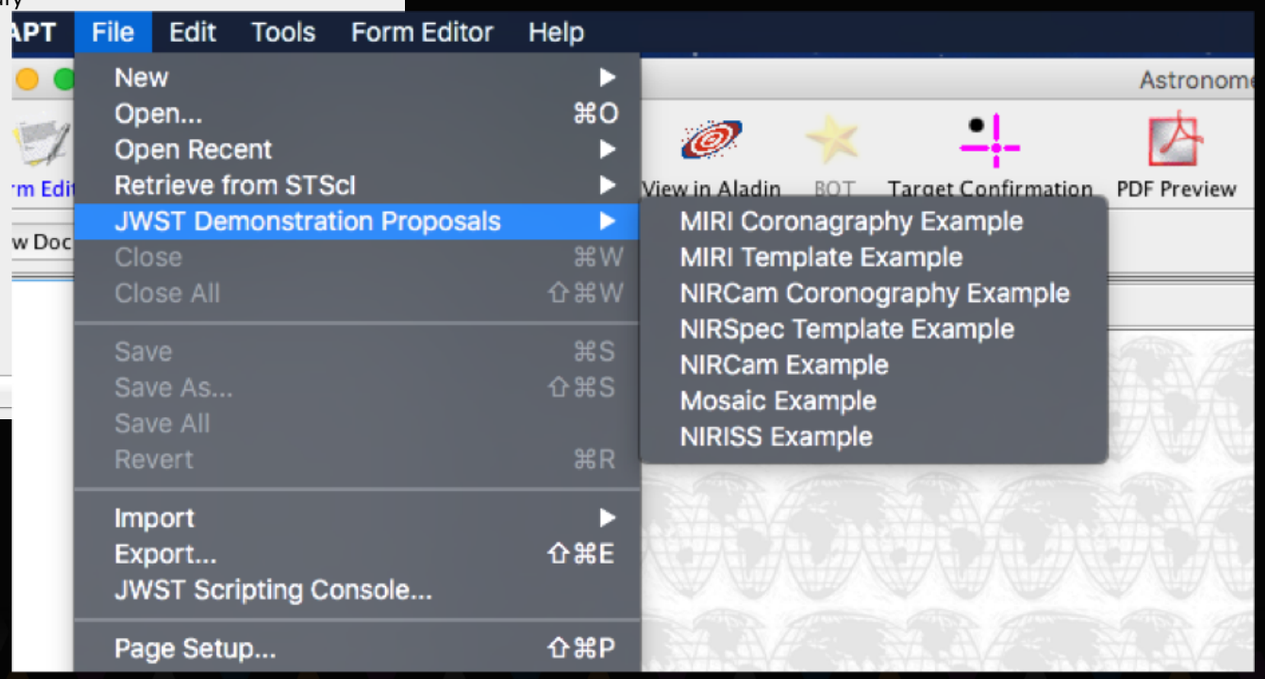


JWST Observer Website
https://jwst.stsci.edu/



The JWST Astronomer's Proposal Tool (APT)





Included in APT 25.2:

- All science observing modes
- NIRSpec MSA Planner
- Coordinated Parallel Observations
- Demonstration Proposals
- Target visibility and guide star availability
- and more!

Download Latest Version at http://apt.stsci.edu

JWST Exposure Time Calculator

Version 1.1

Exposure Time Calculator Edit Expand Klaus Pontoppidan Help

1						
1						
9		niriss wfss	1	425.20	123.13	
8		miri mrs	3	2497.50	240.46	
7		nirspec fixed_slit	1	1528.00	46.00	
4		nircam wfgrism	1	1934.66	97.75	
3		niriss wfss	1	425.20	116.46	
2		miri lrsslitless	1	6.55	2.96	
1		miri mrs	2	3330.00	28.15	
-	-	---	-	--.-	--.-	-

2:

Normalize at wavelength: 10 mjy lambda 20 μm

Normalize in bandpass: 0.00001 flam at

JWST: MIRI/IMAGING F560W

HST: WFC3/IR F098M

Other: Bessel H

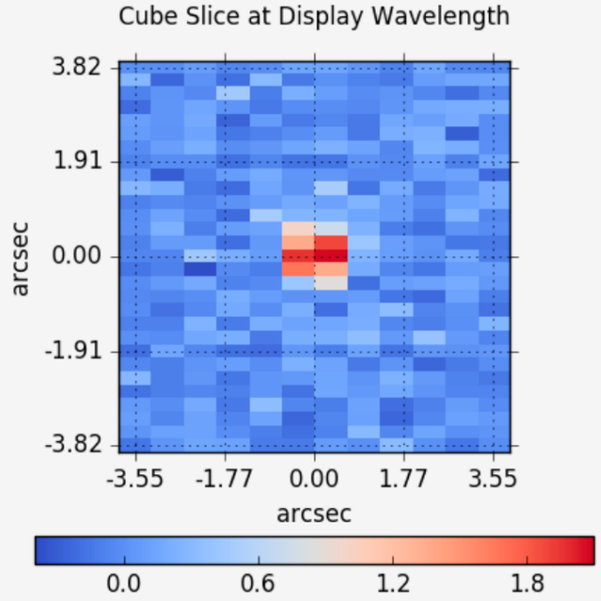
Calculation selected: 1, **Mode:** miri mrs Reset Calculate

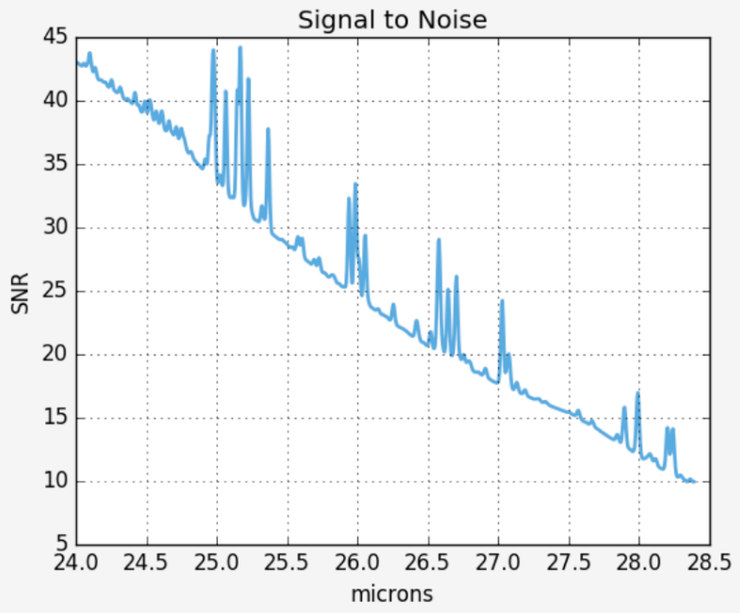
jwst.etc.stsci.edu

Images

Calculation selected: 1, **Mode:** miri mrs

2D SNR | Detector | Saturation





Reports

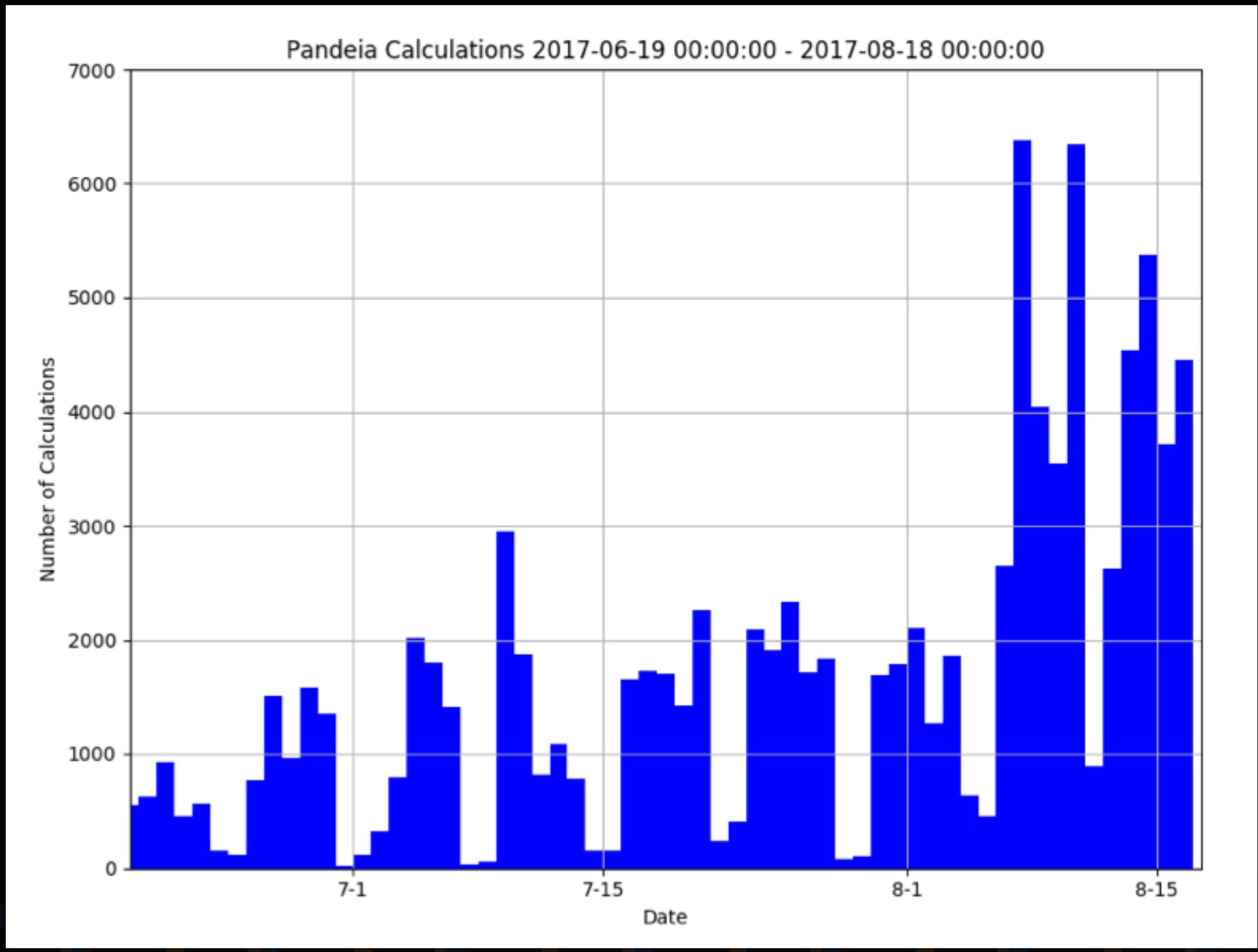
Calculation selected: 1, **Mode:** miri mrs

Report | Warnings | Errors | Downloads

Instrument Filter/Disperser:	null/long
Extraction Aperture Position (arcsec):	[0.00, 0.00]
Wavelength of Interest used to Calculate Scalar Values (microns):	26.00
Size of Extraction Aperture (arcsec):	1
Total Time Required for Observation (seconds):	6660.00
Total On-Source Time (seconds):	3330.00
Extracted Flux (e-/sec):	15.14
Variance in Extracted Flux (e-/sec):	0.54
Extracted Signal-to-Noise ratio:	28.15
Input Background Surface Brightness (MJy/sr):	1737.12
Total Background Flux in Extraction Aperture (e-/sec):	262.47
Sky Background Flux in Extraction Aperture (e-/sec):	262.47
Fraction of Total Background due to Signal From Scene:	0.00
Average Number of Cosmic Rays per Ramp:	0.04

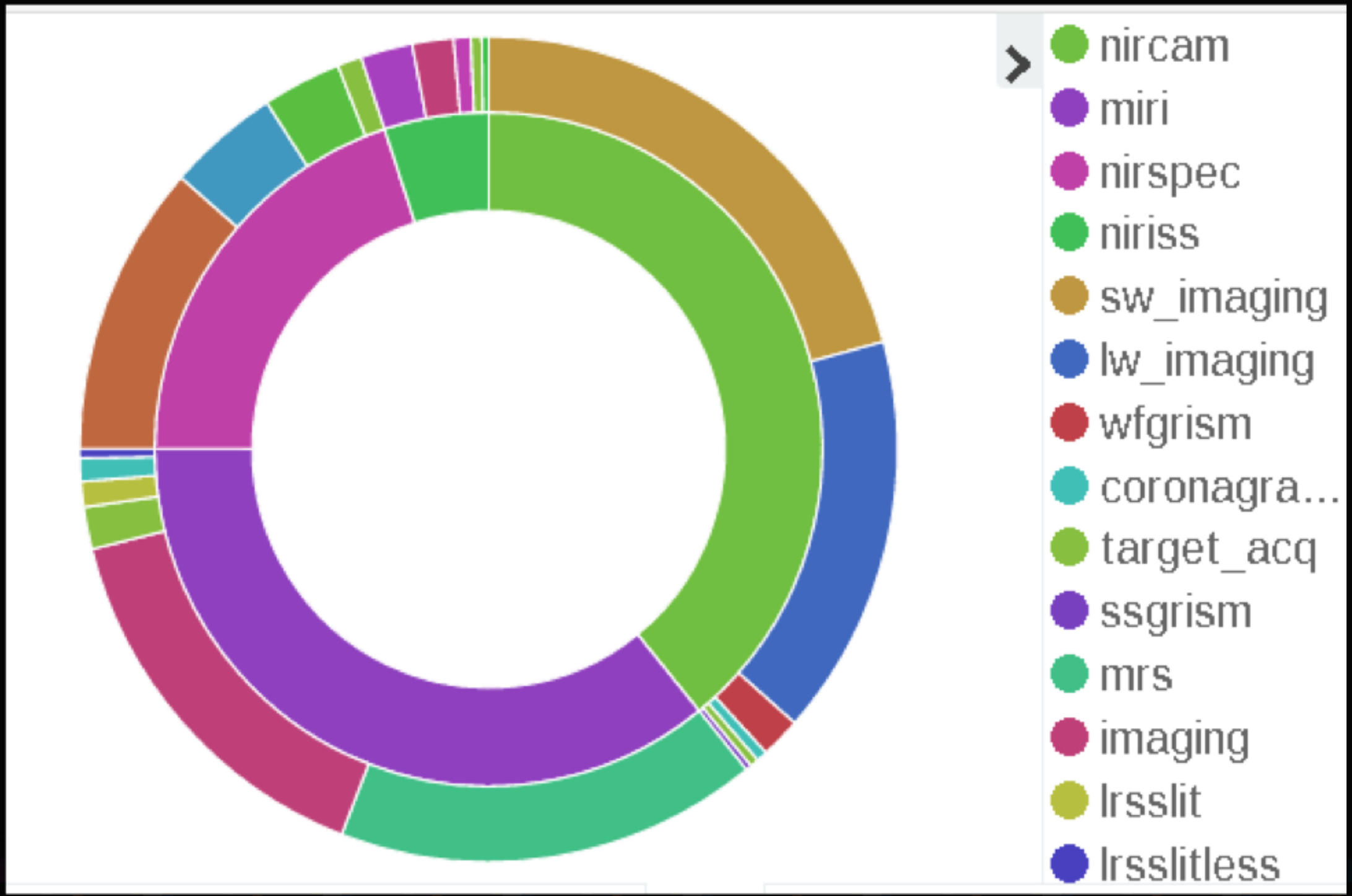
ETC engine also available:
http://ssb.stsci.edu/pandeia/engine/1.1.1/

JWST Exposure Time Calculator



JWST ETC usage in lead up to DD ERS proposal deadline

JWST Exposure Time Calculator



JWST ETC usage in lead up to DD ERS proposal deadline

JWST Help Desk

James Webb Help Desk

APT Support
Request assistance with the Astronomer's Proposal Tool (APT)
View Details

ETC Support
Request assistance with the Exposure Time Calculator (ETC)
View Details

JWST Science Policies
Request assistance for Science Policy Issues.
View Details

MAST Services
Information about the MAST Archive
View Details

MIRI Support
Request assistance with the Mid-Infrared Instrument (MIRI)
View Details

NIRCam Support
Request assistance with the Near-Infrared Camera (NIRCam)
View Details

NIRISS Support
Request assistance with the Near-Infrared Imager and Slitless Spectrograph (NIRISS)
View Details

NIRSpec Support
Request assistance with the Near-Infrared Spectrograph (NIRSpec)
View Details

Office of Public Outreach
Contact the STScI Office of Public Outreach about JWST
View Details

Operations and Scheduling
Ask questions about scheduling and operations with JWST.
View Details

Pipeline Support
Request assistance with the JWST pipeline
View Details

WebbPSF / JWST Telescope
Request assistance with the WebbPSF tool or the Telescope optical system.
View Details

JWST General Support
Request general JWST support for issues not covered by another category.
View Details

STScI | JWST Help Desk

Welcome to the James Webb Space Telescope Help Desk

jwsthelp.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

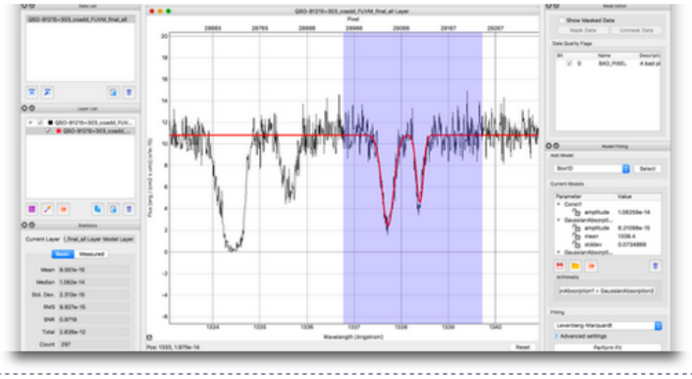
Online Resources

JWST Observer News & Events

Manage Subscription Options: profile.stsci.edu

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

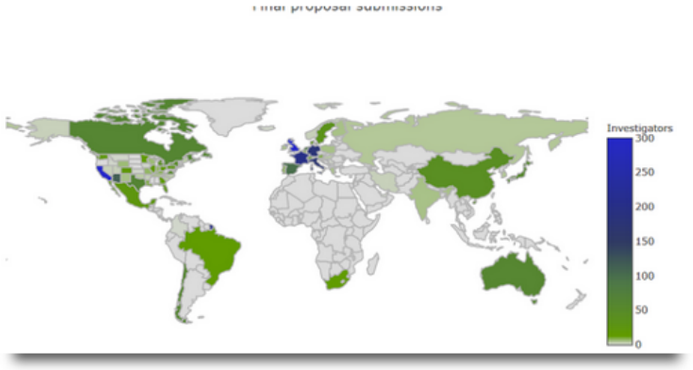
JWST Observer News



James Webb Data Analysis Development Forum Releases SpecViz Version 0.4.0

News Feature • August 29, 2017

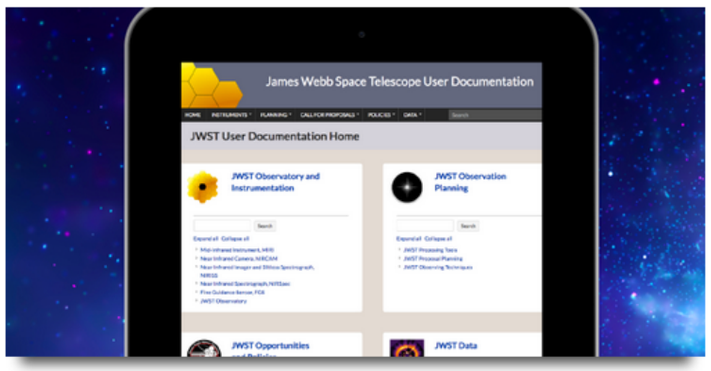
STScI is developing SpecViz, a one-dimensional astronomical spectral visualization and analysis suite, to support all types of astronomical spectral data.



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

JWST Observer Workshops & Webinars

NEWS & EVENTS › | Events

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 w
which is going to be held at the Utah
help potential JWST observers of So

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

SCIENCE PLANNING › | Workshops and Lectures

Workshops & Lectures

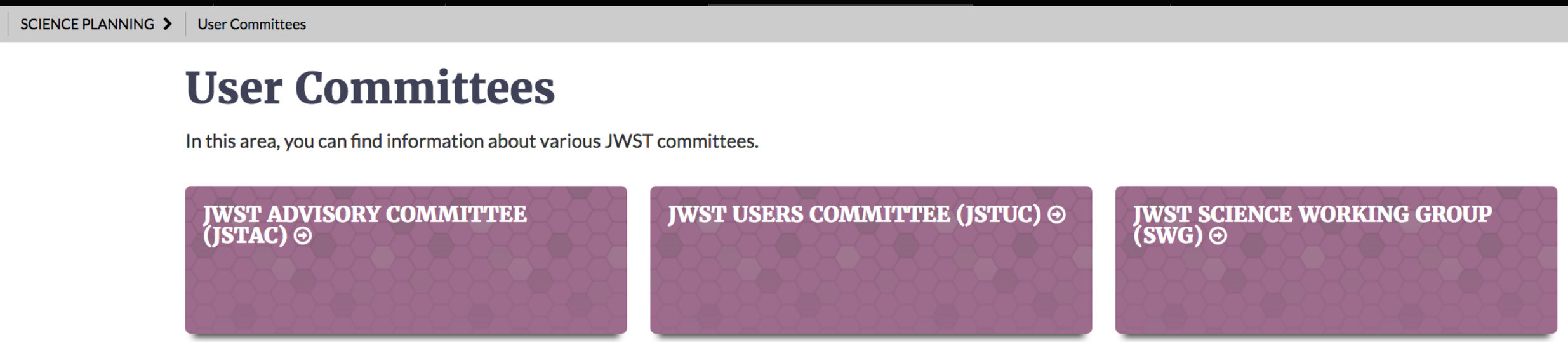
Use the links below to learn about JWST workshops and lectures to prepare you for the ERS and GO Cycle 1 proposal deadlines and the overall JWST mission.

WORKSHOPS ⊙

COMMUNITY LECTURE SERIES ⊙

Workshops and Webinar Recordings and Materials Archived Online

JWST User Committees



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: ICS

Name	Institution
James Bullock	University of California, Irvine
Kat Barger	Texas Christian University
Natalie Batalha	NASA-Ames
Saida Caballero-Nieves	Florida Institute of Technology
Stephane Charlot	Institute d'Astrophysics, Paris
Duncan Farrah	Virginia Polytechnic Institute and State University
Tom Greene	NASA-Ames
Amanda Hendrix	Planetary Science Institute
Kelsey Johnson	University of Virginia
Heather Knutson	California Institute of Technology
David Lafreniere	Universite de Montreal
Mario Mateo	University of Michigan
Els Peeters	University of Western Ontario
Laura Pentericci	INAF, Osservatorio Astronomica di Roma
Mike Ressler	NASA-JPL
Johan Richard	Universite de Lyon
Tommaso Treu	University of California, Los Angeles

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

eptember 14 - 15, 2017
TScI Baltimore, MD

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

Meeting Agenda

he 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	Welcome & GSFC Status - SWG update	J. Mather
9:30-10:15	JWST Project Report - JWST test updates	W. Ochs
10:15-11:00	JWST Mission Office Report - SOC status	M. Stiavelli/N. Lewis

https://jwst.stsci.edu/science-planning/user-committees/jwst-users-committee-jstuc