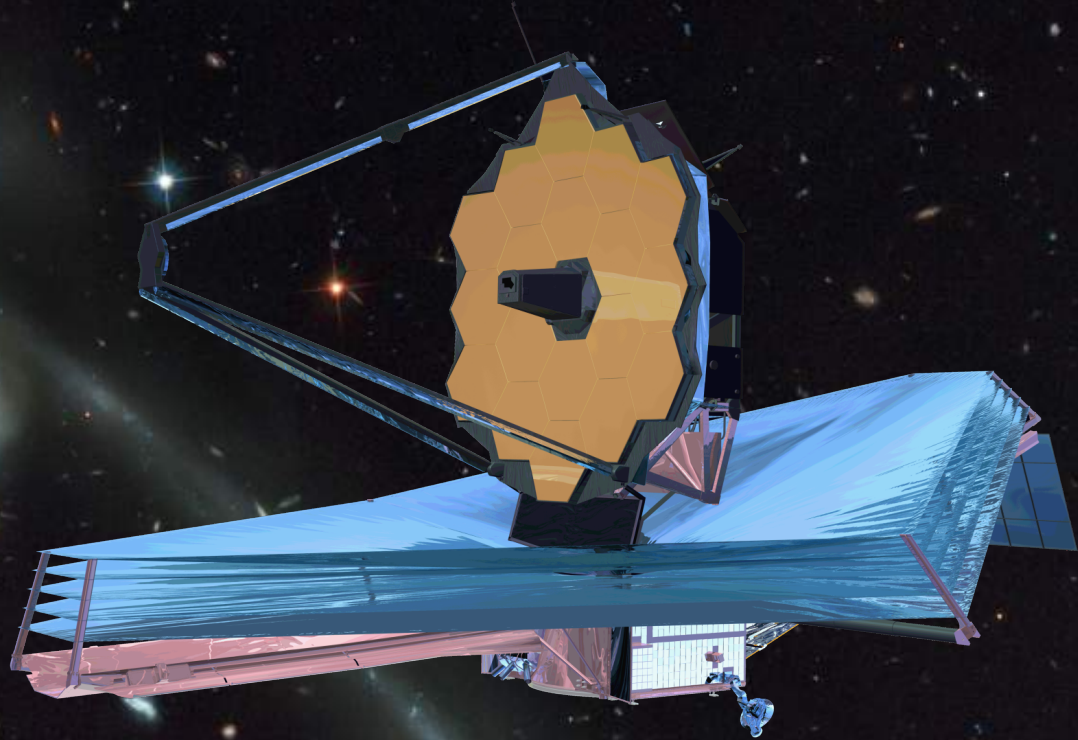


# STScI Activities for JWST



Massimo Stiavelli

JWST Italian Information Day

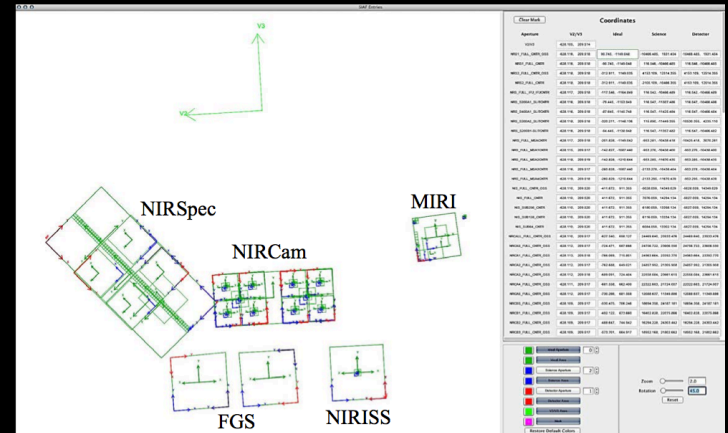
October 9, 2014

# Outline of Presentation

- STScI SOC Role and Organization
- Timeline
- JWST Tools
- Interface to the Community

# Guiding principles

- Enable the best science from JWST
- Implement the science and mission ops for JWST
- Maintain community awareness and support for JWST



The screenshot shows the James Webb Space Telescope website. The main heading is "James Webb Space Telescope The JWST Corner". Below this is a navigation menu with links like Home, About Us, Current Missions, Data Archives, News and Education, Future Missions and Initiatives Support, Research, and Events. The main content area features a "Required Information" form with fields for First Author's Name, First Author's e-mail, First Author's Affiliation, Co-author Names, Status of Paper, Title of Paper, and Paper Abstract. There is also an "Optional Information" section with fields for Journal Reference, astro-ph/, and A brief summary.

# STScI Roles in JWST

- Manage the science program from observing program solicitation and selection to grants management and science outreach support.
  - STScI Director is the selecting official for observing time
- Operate JWST - beginning in commissioning (new compared to HST)
- Develop the science and operations ground systems
- Perform ground segment verification and end to end testing
- Participate with the Project and JWST teams in flight segment development:
  - Mission architecture & systems engineering
  - Science instruments and Integrated Science Instrument Module
  - Telescope optics and wavefront sensing and control
  - Flight Software
  - Science and Operations input into design and test processes
- Scientific and Public Outreach
- Apart from Institute's role as S&OC, we also have the Telescope Scientist (Matt Mountain) and an Interdisciplinary Scientist (Massimo Stiavelli)

# Science and Operations Center

Additional functions:

Users' support

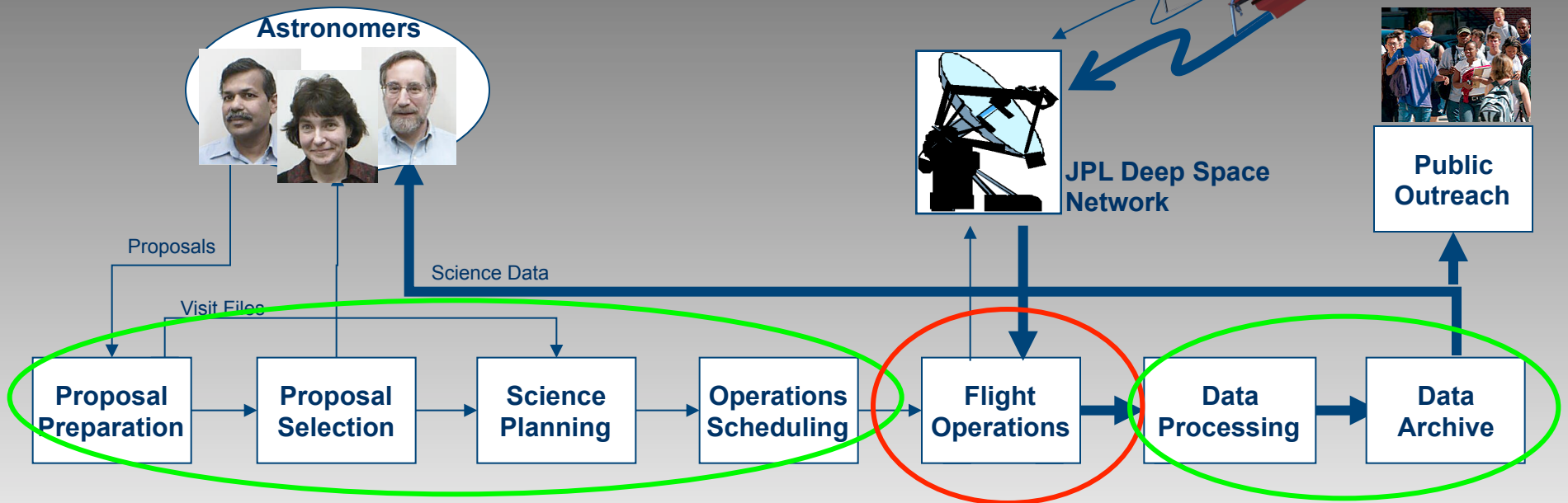
Analysis tools

Calibration

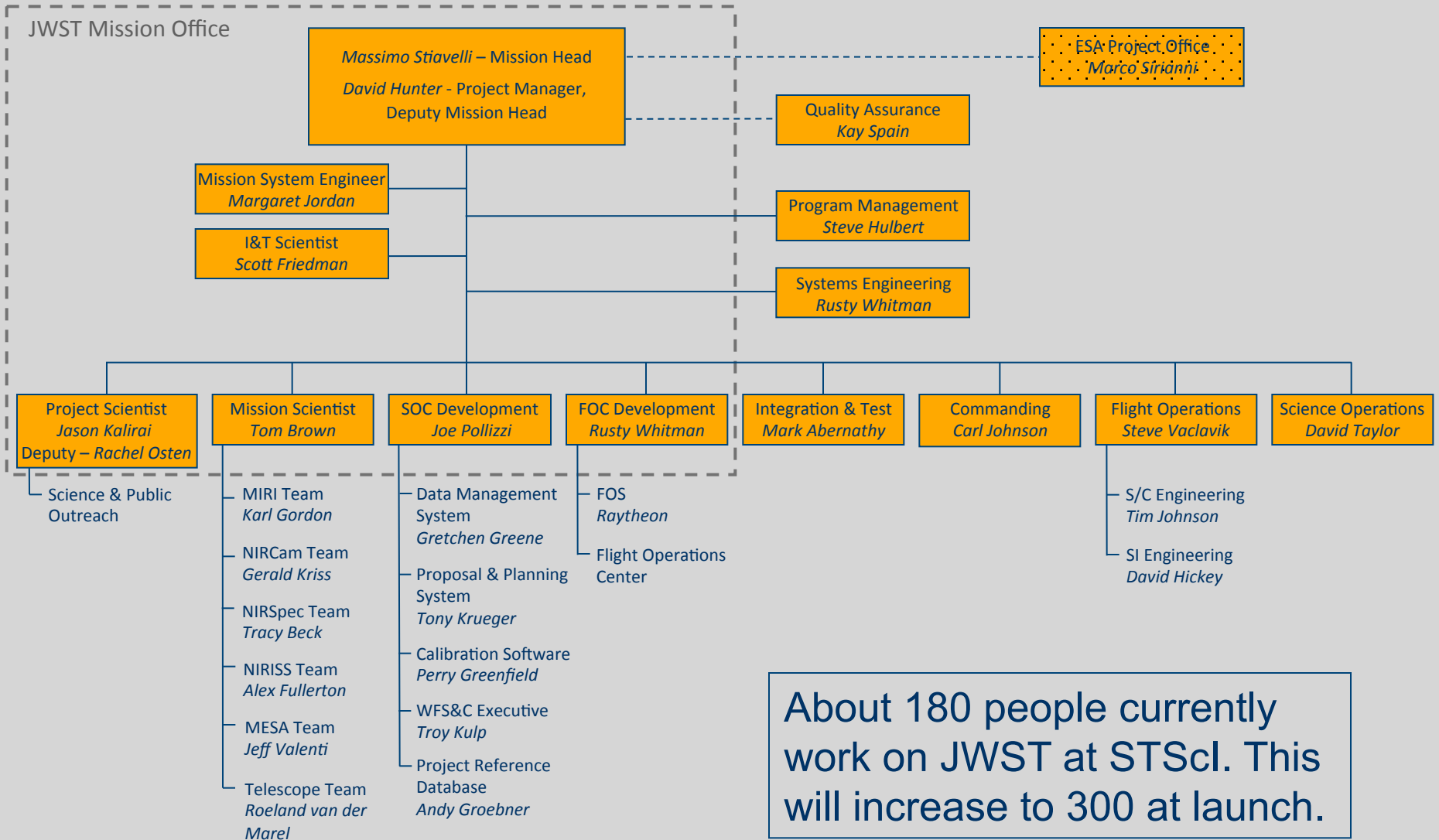
Wavefront Sensing and Control

Project Reference Database

On-board operations scripts...



# JWST Mission Organization – STScI



# NASA JWST Major Events to launch

manufacturing the spacecraft and next cryogenic tests (CV2)

observatory assembly  
1) instruments connected to mirrors &  
2) spacecraft connected to sunshield

2013

2014

2015

2016

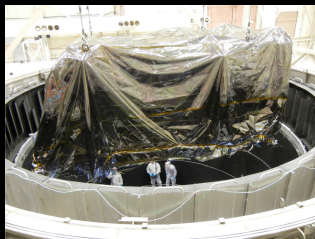
2017

2018

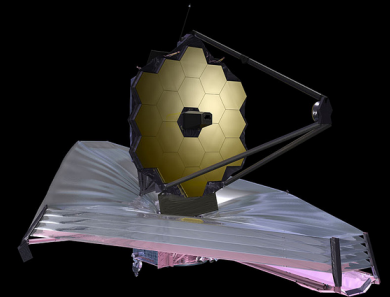
making the mirrors: the 21 ft primary, secondary, and aft mirrors become one unit, CV3

integration of science instruments & first cryogenic tests (CV1)

integration between observatory & sunshield, shipping & LAUNCH



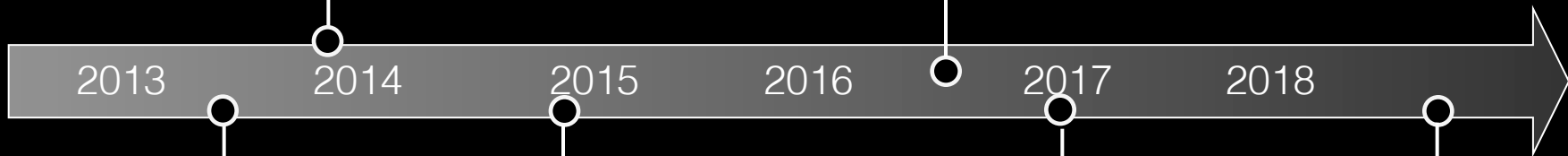
observatory testing: a comprehensive test at JSC of the integrated telescope and instruments



# STScI JWST Major Events to launch

analyze full science instrument data from CV2 & support tests

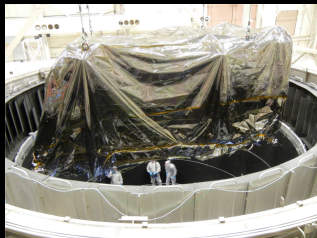
First integrated Science Operations Center software released - workshops for JWST science community ready



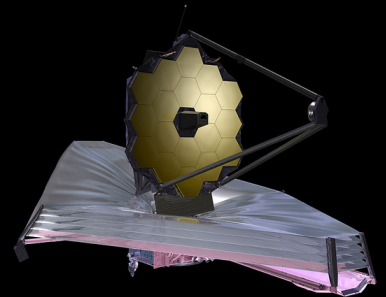
final verification for instrument tests (CV3), & STScI onboard JWST commands extensively tested

Time Allocation process, planning & scheduling of first JWST observations.

250+ onsite shifts at GSFC to support ISIM CV1 test

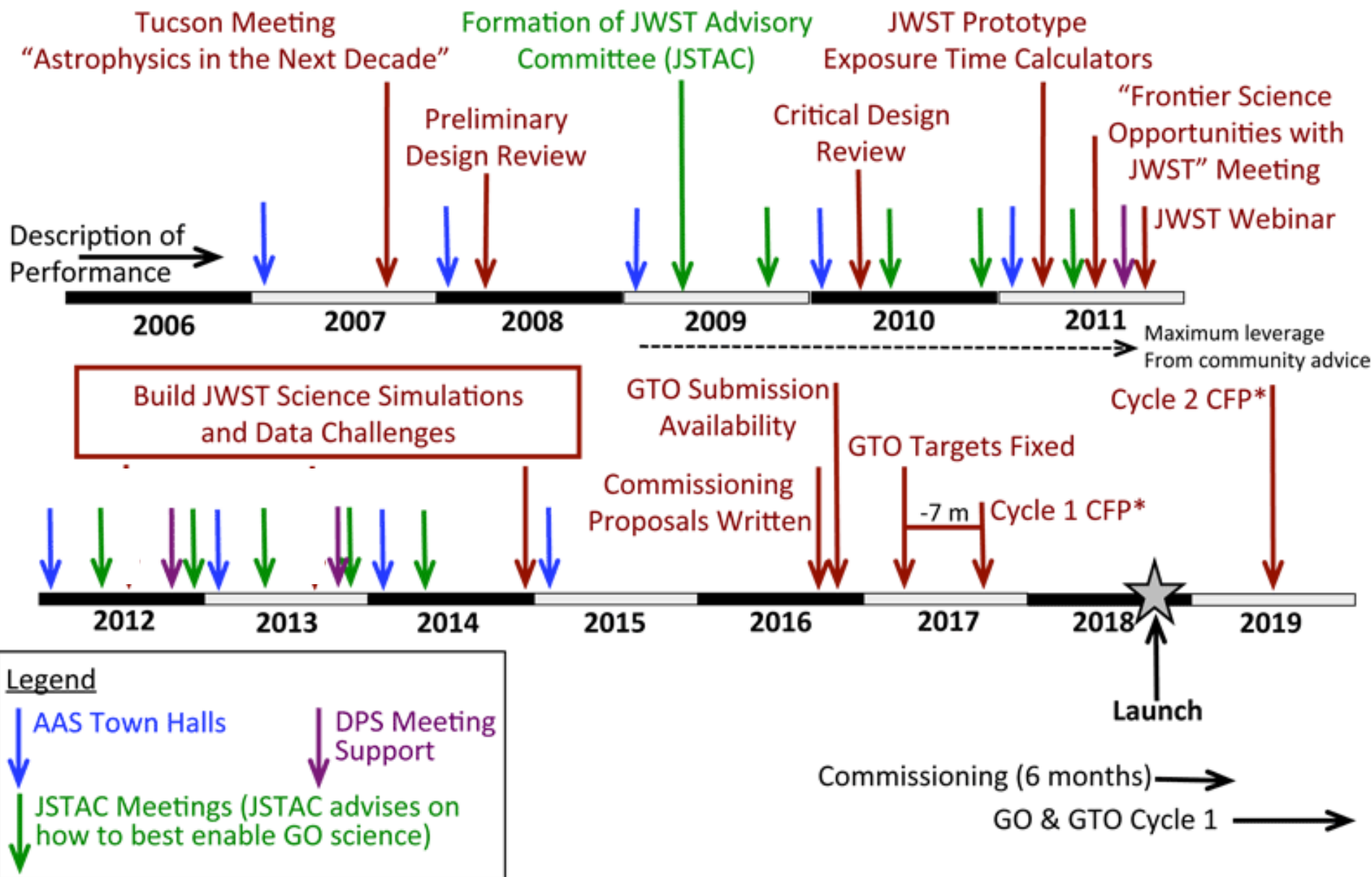


test of the SOC wavefront sensing and control at JSC - communication test with DSN





# JWST Science Planning Timeline (CY)



\*The Call for Proposals (CFP) will describe science programs: GTO, GO/GTO split, Legacy/Key/Large program guidelines, etc.

# The Astronomer's Proposal Tool (APT) has templates for all four instruments

For astronomers, the “look and feel” of JWST will be very similar to HST

Astronomer's Proposal Tools Version 17.4 develop (Fri Nov 21 00:39:15 EST 2008) - Unsubmitted Proposal (Unsaved)

Form Editor Spreadsheet Editor Orbit Planner Visit Planner View in Aladin BOT MSA PDF Preview Submission Errors and Warnings Run All Tools Stop

New JWST Proposal New Observation Folder New Observation JWST Demo Readme What's New? Roadmap

Unsubmitted Proposal (Unsaved)  
Proposal Information  
PI: Dr. Galen Adams  
Targets  
1 MESSIER-049 (Fixed Target)

Observation 1 of Unsubmitted Proposal (Unsaved)

Label:

Comments:

Target: 1 MESSIER-049 (Fixed Target: Equatorial)

Instrument: MIRI

Template: MIRI Imaging

Subarray: FULL

Object Type: BRIGHT

Filter	Requested Exp Time	Readout Pattern	No. of Groups	No. of Integrations	Calculated Exp Time
F560W	2000.0	FAST	1	738	2001.12
F1280W	1700.0	FAST	1	644	1700.16
F2550W	1000.0	FAST	1	379	1000.56

Filters:

Edit Observation Folder New Edit Visit 1.1

Observa...	Number	Label	Comments	Target	Instrument	Template	Subarray	Object Type	Filters
Observati...	1			1 MESSIER...	MIRI	MIRI Imagi...	FULL	BRIGHT	F560W 2...

Show: Observation

2 errors & warnings (Click for Details)

Astronomer's Proposal Tools Version 17.4 develop (Fri Nov 21 00:39:15 EST 2008) - Unsubmitted Proposal (Unsaved)

Form Editor Spreadsheet Editor Orbit Planner Visit Planner View in Aladin BOT MSA PDF Preview Submission Errors and Warnings Run All Tools Stop

New JWST Proposal New Observation Folder New Observation JWST Demo Readme What's New? Roadmap

Unsubmitted Proposal (Unsaved)  
Proposal Information  
PI: Dr. Galen Adams  
Targets  
1 MESSIER-049 (Fixed Target)

Observation 2 of Unsubmitted Proposal (Unsaved)

Comments:

Target: 1 MESSIER-049 (Fixed Target: Equatorial)

Instrument: MIRI

Template: MIRI Coronagraphic Imaging

Target ACQ: None Selected

AcqTarget AcqFilter AcqFlux

Object Type: BRIGHT

Coron Mask/Filter	Requested Exp Time	Readout Pattern	No. of Groups	No. of Integrations	Calculated Exp Time
409M/F105C	1450.0	FAST	1	530	1452.0
LYOT/F2300C	900.0	FAST	1	341	900.24

Filters:

Add Remove

Edit Visit 1.1 New Edit Visit 2.1

Observation	Number	Label	Comments	Target	Instrument	Template	AcqTarget	AcqFilter	AcqFlux	Object Type
Observati...	1			1 MESSIER...	MIRI	MIRI Imagi...	FULL	BRIGHT	F560W 2...	
Observati...				1 MESSIER...	MIRI	MIRI Coro...		F560W	13	BRIGHT

Show: Observation

5 errors & warnings (Click for Details)

(download at <http://www.stsci.edu/hst/proposing/apt>)

# Mosaic Tool

The screenshot displays the 'Mosaic Tool' interface, which is part of the 'Astronomer's Proposal Tools Version 17.4 - JWST Proposal (v838-jwst.apt)'. The main window shows a star field with a 2x5 grid of observation patterns overlaid. The 'Mosaic' control panel includes the following settings:

- Pattern Size: Rows: 2, Cols: 5
- Pattern Controls: Row Overlap (%): 0.0, Col Overlap (%): 23.4, Skew X (Deg): 12.9, Skew Y (Deg): 0.0, Orient: 67.8

A table below the controls lists observation details:

Observation	Number	Instrument	Instrument...	Coming So...	Object Type	Subarray	Filters	Total Time	Dither Pat...	Dither Point
Observati...	1	MIRI	MIRI Imagi...	Gyro,	BRIGHT	FULL	[F560W 2...	2001.12	Dither Pat...	[edu.stsci...

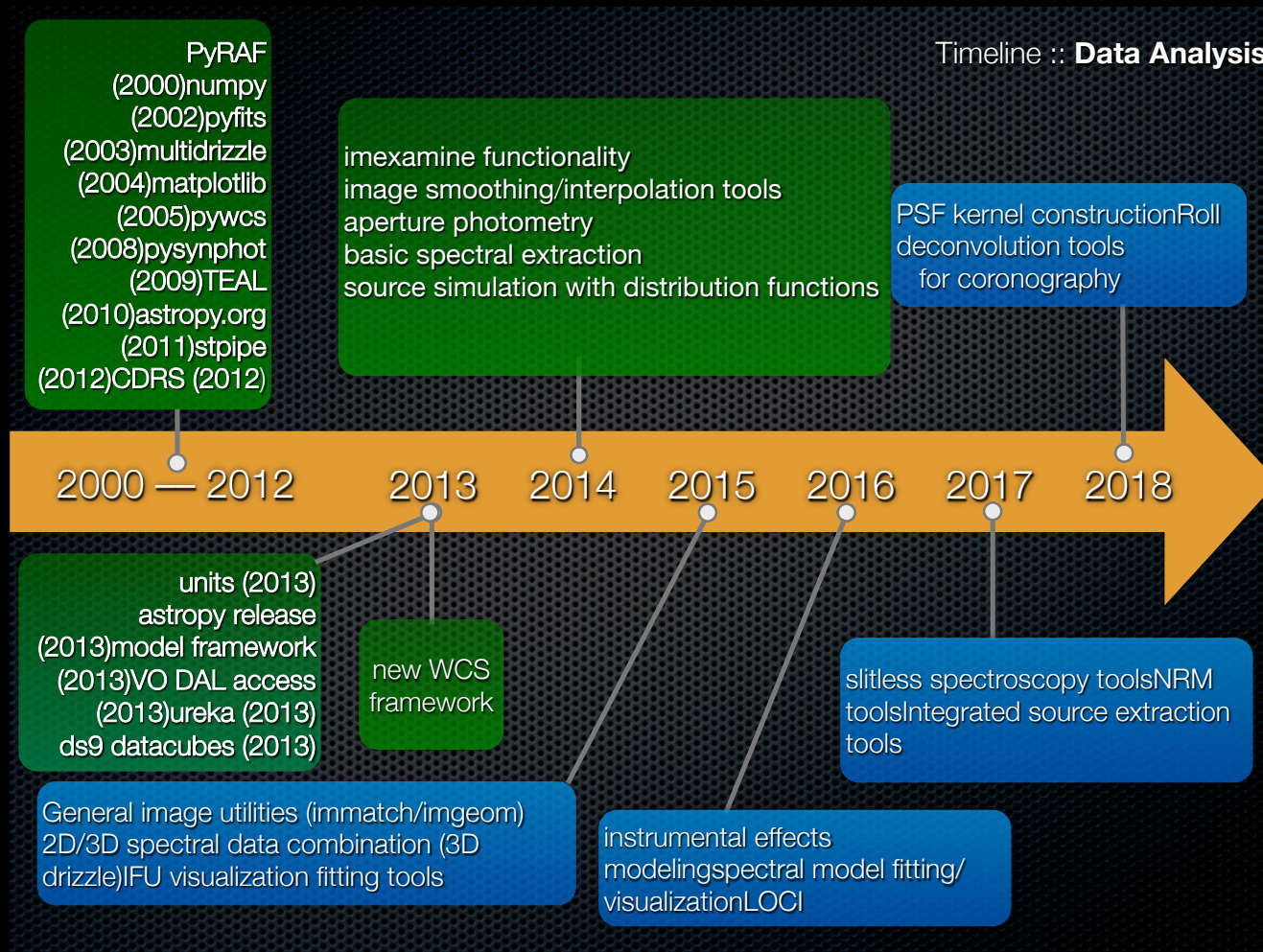
The interface also features a 'Multimission Archive at STScI (MAST)' search window with the following fields:

- Target: 07:04:05.21 -03:50:48.5
- Radius: 2.5'
- Mission/Instrument: ALL - Search all missions

The bottom of the screen shows a Windows taskbar with various application icons and a system tray. The status bar at the bottom right indicates 'Aladin.app' and '0 sel / 0 src'.

# Data Processing Workshop

First planned for ~March 2015, based on availability of tools by end of CY2014, annual event thereafter. Interactive workshop will allow feedback on tools



# Interface to the Community

- Science Working Group includes several “Europeans”



- JWST Advisory Committee



- User Committee (in the future)
- Regular American Astronomical Society presence