



Cepheid

JWST NIRCAM

Depth



STScI | SPACE TELESCOPE
SCIENCE INSTITUTE

EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

MIRI Mid-Infrared

JWST Community Engagement

NIRCam Near-Infrared

MIRI and NIRCam

Stacey Bright

JWST Mission Office

JSTUC Meeting March 18-19 2024





JWST Community Engagement

- We aim to provide the JWST User Community with the most up-to-date information on observatory operations, instrument performance, pipeline, calibration, data analysis tools, proposals, surveys & events
- Our main initiative since Sept 2023 JSTUC has been to improve our communication by increasing direct engagement with the community, including in-person interaction
- How we reach out:
 - Webb Office Hours
 - JWWebinars
 - AAS ‘Ask-an-Expert’ and Townhalls
 - JWST Observer News Items and Articles
 - Workshops (Improving JWST Data Products - Nov 2023 see D. Law’s Pipeline talk)
- How the community can reach us:
 - JWST Help Desk
 - Dedicated Instrument Scientists for PIs
 - User Survey (See M. Garcia Marin’s User Survey talk)





JWST Community Engagement – Webb Office Hours

- **Webb Office Hours**
 - In direct response to JSTUC feedback for more direct/in-person interaction
 - Invite community to join a team of STScI experts via WebEx to directly ask their data questions
 - Cadence: 2nd and 4th Thursday of each month (started 8 Feb 2024)
 - Wide range of 2-4 experts chosen per week (mainly from Instrument teams)
 - Answer questions on Pipeline, calibration, instrument performance, proposal planning, etc.
 - Not recorded, but Q&As are captured on the [JWST Event Archive Page](#)

The screenshot shows the JWST Event Archive website. The header includes the JWST logo and the text 'JWST Event Archive'. A navigation menu on the left lists 'JWST Event Archive Home', 'Improving JWST Data Products ...', and 'Webb Office Hours' with sub-items 'WOH 22Feb2024' and 'WOH 8Feb2024'. The main content area displays 'Pages / JWST Event Archive Home' with '291 views' and the title 'Webb Office Hours'. Below the title, it says 'Created by Stacey Bright, last modified on Feb 29, 2024'.









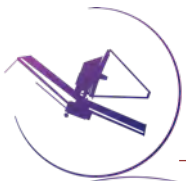
JWST Community Engagement – Webb Office Hours

- **Webb Office Hours to-date**

- Session 1
 - technical difficulties stopped most from attending
 - 2 participants
 - 8 questions mainly about MRS data and analysis
 - MRS striping, bad pixel masks
 - background subtraction methods
 - spectral extraction in cubeviz
- Session 2
 - 1 participant
 - 1 question on header keywords (EFFINTIME)
- Session 3
 - 2 participants
 - 1 MRS repeat customer
 - outlier detection step with very large datasets

Sessions:

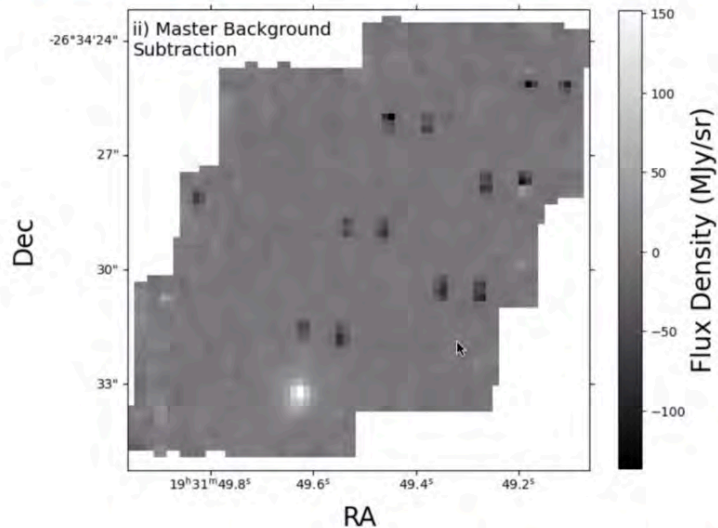
Date	Q&A Archive
 08 Feb 2024	WOH 8Feb2024
 22 Feb 2024	WOH 22Feb2024
 14 Mar 2024	
 28 Mar 2024	



JWST Community Engagement – Webb Office Hours

- **Webb Office Hours**
 - initial sessions already yielding improvements to documentation based on questions asked
 - Users came prepared with images and notebooks to share
 - E.g. two questions on “black dots in MIRI MRS” yielded updates to JDOx (release late March)

3. Q: What causes the black dots in the MIRI MRS channel 2 image below?



New JDOx Page

A: These are bad pixels. The bad pixel mask was updated a couple weeks ago. Try reprocessing again and these will hopefully be eliminated. If the problem persists, we recommend that you submit a Help Desk question to get additional help on this topic.

Artifacts

Bad Pixels

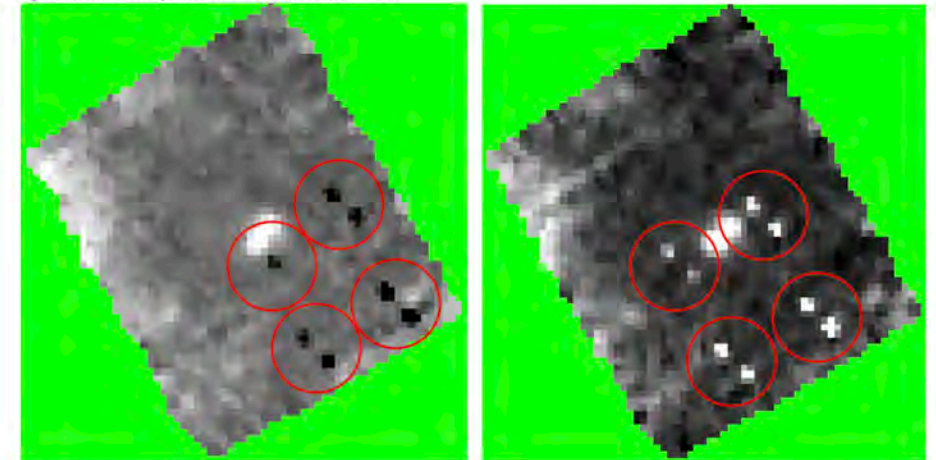
Over time the number of bad and/or warm pixels on the MIRI MRS detectors is increasing, resulting in salt & pepper noise in the 2d calibrated data. These are caught by the outlier detection step in the calwebb_spec3 pipeline prior to combination of the data into final dither-combined 3d data, but nonetheless make it through into the cubes. These can be particularly noticeable in mosaic observations, as the same artifact will show up in multiple frames throughout the composite data cube (see Figure 1).

In January 2024 (CRDS context 1185) the MRS bad pixel masks were therefore updated with new bad pixel masks for every six months of the mission, adjusting the flagging thresholds for shallow, medium, and deep observations. Shallow observations (defined as FASTR1 data with fewer than 50 groups) have the most aggressive flagging, flagging only the brightest warm pixels that would be visible above the detector readout noise. Medium observations (defined as FASTR1 data with more pixels, corresponding to the lower effective detector noise). Deep observations (defined as any SLOWR1 data) use the most aggressive flagging, flagging four times as many pixels as the shallow mask. Regular updates will continue to be delivered throughout the mission.

In Figure 2 we illustrate an example calibrated Ch3/Ch4 detector image before and after this update, noting the substantial improvement in data quality after the [replacement routine](#) interpolating across newly identified bad pixels.

For any remaining artifacts, it can be helpful to use dedicated background observations taken with the science data to generate and apply a cube-wide background mask.

Figure 1. MRS bad pixels in a mosaic observation



Images of an MRS mosaic data cube showing typical bad pixel artifacts (circled in red); since these correspond to a fixed location on the detector, they appear at regular locations in the final cube. In this case, the pair of nearby artifacts is produced by a 2-pt dither, which is repeated four times as the detector is scanned. Artifacts can be either positive or negative. Bright green pixels represent NaN-valued regions outside the IFU footprint.



JWST Community Engagement – Webb Office Hours

- **Webb Office Hours to-date**

- We will be advertising regularly and hoping to grow the number of participants and see if the community wants to keep these events going
- Please share with your community
- Discussion:
Is this useful? Do your colleagues, students want to join? Ideas to engage more?

Sessions:

Date	Q&A Archive
 08 Feb 2024	WOH 8Feb2024
 22 Feb 2024	WOH 22Feb2024
 14 Mar 2024	
 28 Mar 2024	

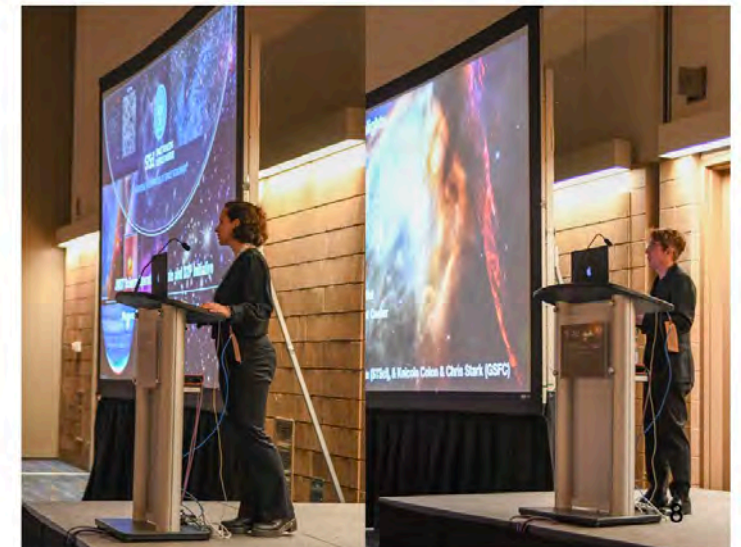


JWST Community Engagement –AAS

- **243rd AAS, New Orleans, LA, 7-11 January 2024**
 - “Ask-an-Expert” at the STScI booth
 - More direct interaction was encouraged by having STScI JWST instrument experts available during the entire meeting to answer data questions or concerns.
 - Success stories
 - Needs more advertising in the future
 - Successful JWST Town Hall
 - Over 220 people in attendance



Questions? Feedback?

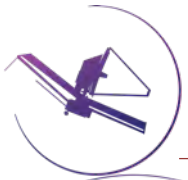




JWST Community Engagement - JWebbinars

- **JWebbinars:**
 - STScI hosts regular [JWebbinars](#) to provide virtual, hands-on instruction on common data analysis tools and methods for JWST observations (e.g. Pipeline , Jdaviz, proposal tools, Jupyter notebook demos)
 - Virtual programming environment (hosted platform) is provided so that participants will not be required to install software prior to attending the event.
 - For many topics participants will get the most out of the event if they are familiar with basic Python coding and the Jupyter notebook interface.



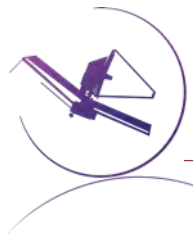


JWST Community Engagement - JWebbinars

- **JWebbinars:**

- To date there have been 31 JWebbinars (starting in Aug 2021)
- Held 7 Events from Sept 2023 – Feb 2024
- Topics were chosen based on the needs of the community; chosen based on feedback from User Survey, Help Desk tickets, and known issues
- Currently planning topics for the 2nd half of 2024

JWebbinar	Date
31 - Pipeline Reprocessing of JWST Imaging Data	Feb 2024
30 - MOS Planning with MPT using an Example Science Case	Jan 2024
29 - JWST NIRSpec Time-Series Observations: From Uncalibrated Data to Transit Light Curves using CalWebb	Dec 2024
28 - Pipeline Reprocessing of Integral Field Unit Spectroscopy	Dec 2024
27 - Introduction to the Astronomer's Proposal Tool for JWST for Cycle 3	Sept 2023
26 - Introduction to the JWST Exposure Time Calculator for Cycle 3	Sept 2023
25 - MAST: The JWST Data Archive	Sept 2023



JWST Community Engagement - JWebinars

- **JWebinars:**
 - Participants Register beforehand in order to get access to the virtual programming environment and Slack channel discussion.

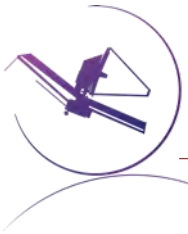
JWebinar	Registered	Attended
31 - Pipeline Reprocessing of JWST Imaging Data	41	26
30 - MOS Planning with MPT using an Example Science Case	32	8
29 - JWST NIRSpec Time-Series Observations	137	62
28 - Pipeline Reprocessing of Integral Field Unit Spectroscopy	77	42
27 - Introduction to the Astronomer's Proposal Tool for JWST for Cycle 3	52	20
26 - Introduction to the JWST Exposure Time Calculator for Cycle 3	40	24
25 - MAST: The JWST Data Archive	41	31
Total	420	213



JWST Community Engagement - JWebbinars

- **JWebbinars:**
 - All events are recorded and the videos are uploaded to [JWebbinar YouTube channel](#)
 - Even if in-person attendance is low, these videos still get YouTube views
 - Currently hold 2 sessions per JWebbinar to accommodate time zones, etc

JWebbinar	Registered	Attended	YouTube Views
31 - Pipeline Reprocessing of JWST Imaging Data	41	26	N/A
30 - MOS Planning with MPT using an Example Science Case	32	8	73
29 - JWST NIRSpec Time-Series Observations	137	62	67
28 - Pipeline Reprocessing of Integral Field Unit Spectroscopy	77	42	125
27 - Introduction to the Astronomer's Proposal Tool for JWST for Cycle 3	52	20	75
26 - Introduction to the JWST Exposure Time Calculator for Cycle 3	40	24	88
25 - MAST: The JWST Data Archive	41	31	48
Total	420	213	476

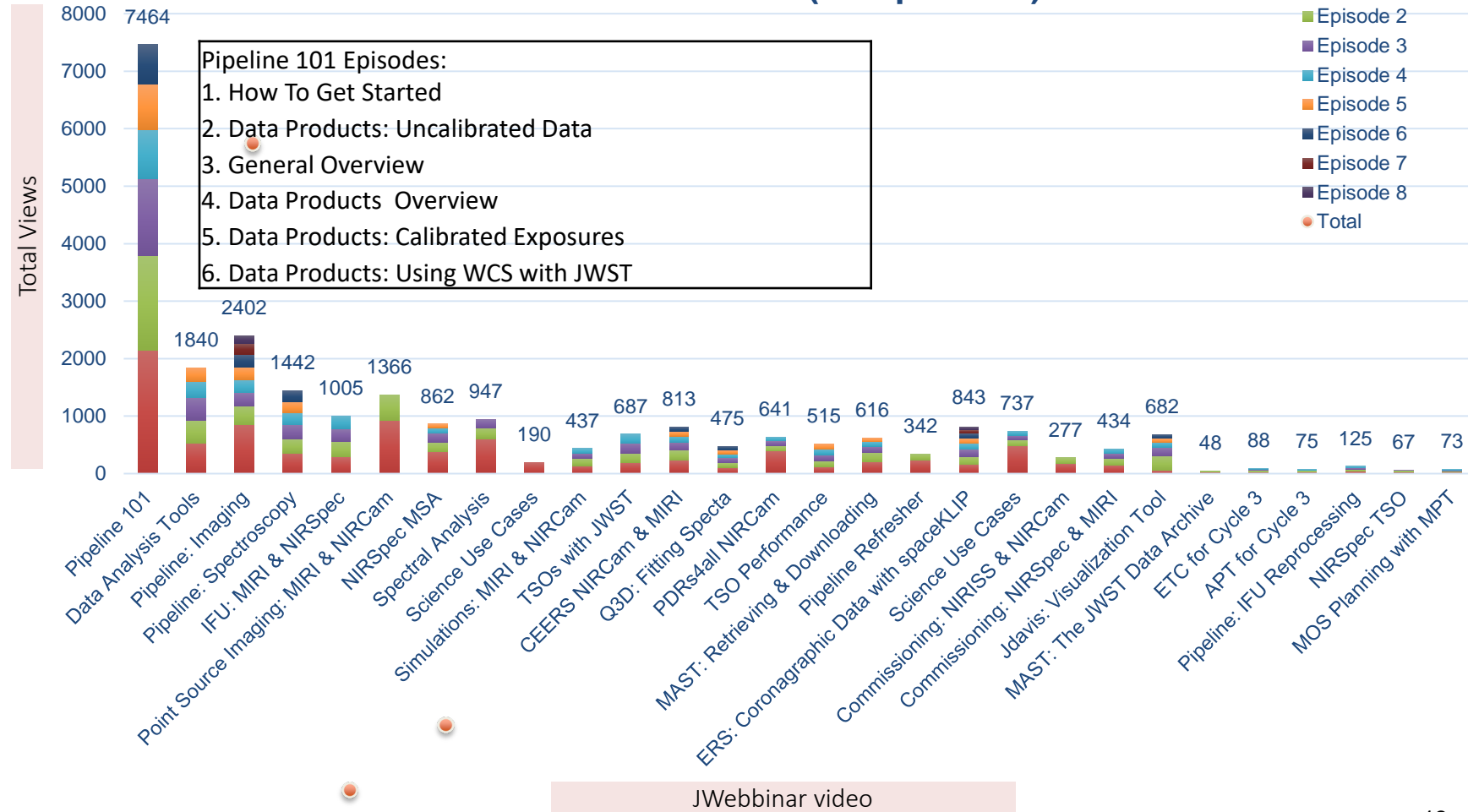


JWST Community Engagement - JWebbinars

JWebbinars:

- Each JWebbinar session is broken down into episodes for YouTube
- Historical videos continue to get many YouTube views
- Total views of all JWebbinars (all episodes): **25,493**
- **Most popular: JWebbinar 1- “Pipeline 101” from 2021**
- Plan to revamp older popular videos with the latest updates and replace any deprecated notebooks, etc.

JWebbinar Views (All episodes)



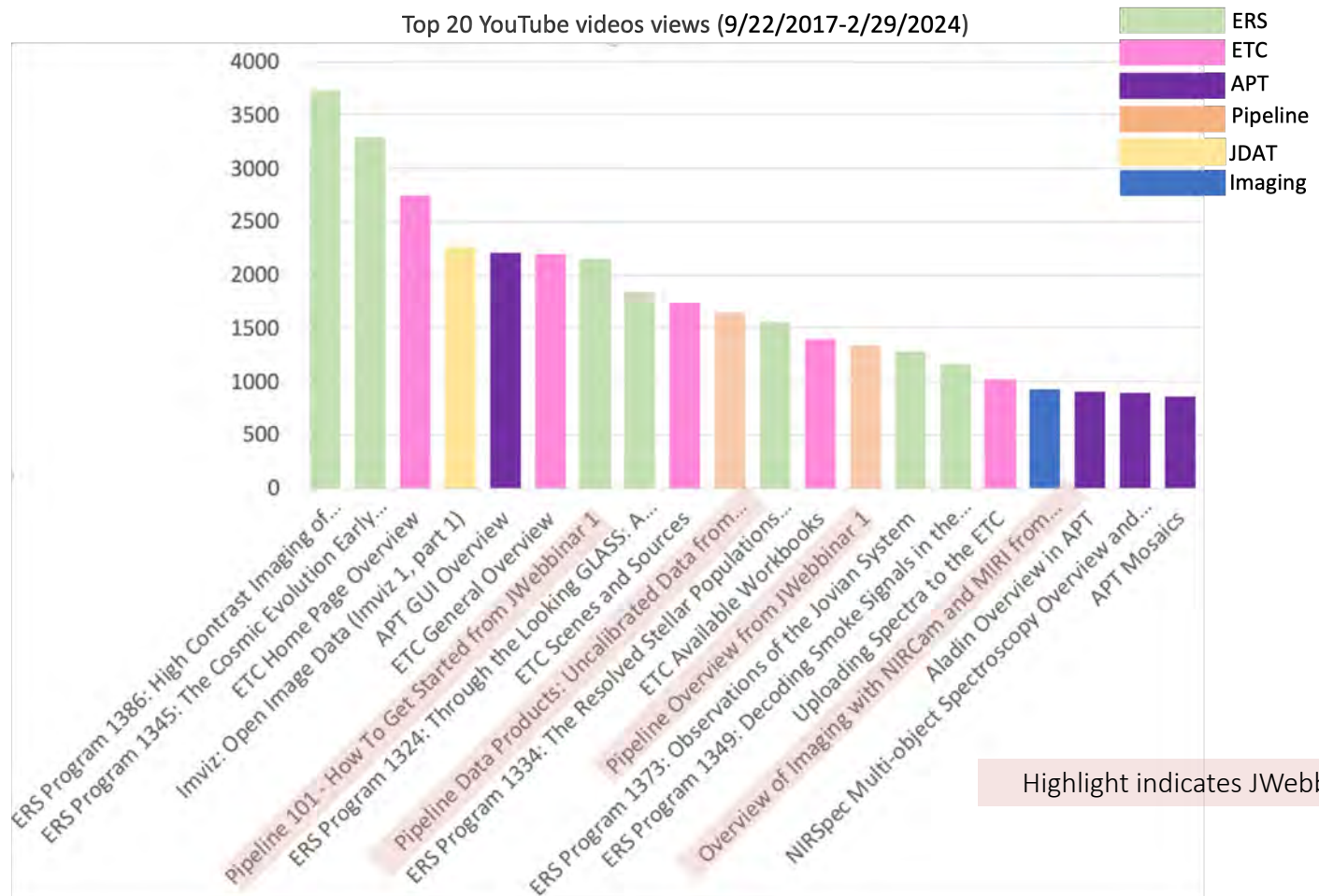


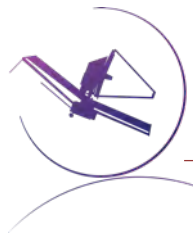
JWST Community Engagement - JWebbinars

- We have other YouTube training videos beyond JWebbinars (ERS programs, ETC, APT)
- Across all STScI JWST YouTube videos, JWebbinars are some of the most popular

Top Videos:

- ERS 1386: High Contrast Imaging of Exoplanets and Exoplanetary Systems with JWST
- ERS 1345: The Cosmic Evolution Early Release Science (CEERS) Survey

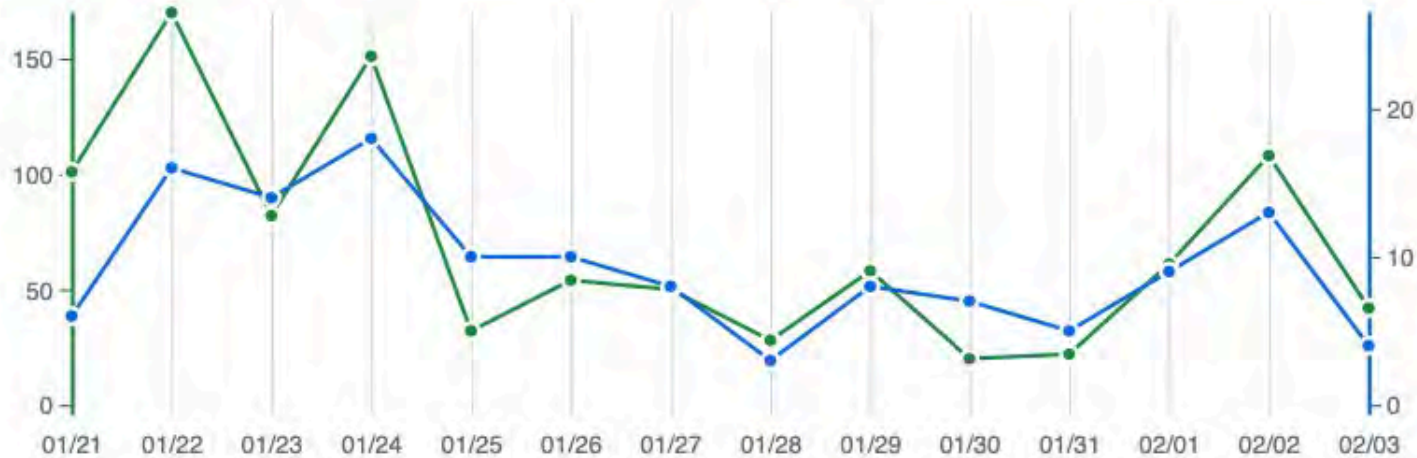




JWST Community Engagement - JWebbinars

- **JWebbinars:**
 - Additional materials and Jupyter Notebooks are available for download on GitHub

Visitors Jan 21 – Feb 03, 2024

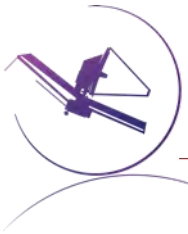


979 Views

99 Unique visitors

Popular content

Content	Views	Unique visitors
jwebbinar_prep/spec_mode/sp...	46	16
jwebbinar_prep/spec_mode at ...	34	10
jwebbinar_prep/imaging_mode...	30	8
jwebbinar_prep/jwebbinar29 at...	26	9
jwebbinar_prep/jwebbinar28 at...	25	10
jwebbinar_prep/ifu_session/MR...	22	6
jwebbinar_prep/imaging_mode...	21	7
jwebbinar_prep/pipeline_infligh...	21	6
jwebbinar_prep/spec_mode/sp...	19	7
jwebbinar_prep/pipeline_produ...	18	8



JWST Community Engagement – Observer News

- **JWST Observer News:**
 - Subscription news mailing list
 - Aim for ~ 4 news items per month
 - Post instrument/calibration/pipeline updates, observatory operations, upcoming events
 - Number of Subscribers = 4,358



Subscribe to the JWST Observer
News Mailing List

Get the latest news delivered directly to
your inbox.

Email Address

JWST Observer News



JWST Community Engagement – Observer Websites

- JWST Observer webpages also includes all science planning and execution pages

The screenshot shows the STScI website header with the logo and 'SPACE TELESCOPE SCIENCE INSTITUTE' text. A search bar is in the top right. The navigation bar includes 'JWST Home', 'About JWST', 'News & Events', 'Instrumentation', 'Science Planning', 'Science Execution', and 'Documentation'. The 'Science Planning' menu is open, listing: 'Calls for Proposals and Policy', 'Program Information', 'Proposal Planning Toolbox', 'Approved Programs', 'Tools from the Community', 'Observing Schedules', 'User Committees', 'JWebinars', 'Data Analysis Toolbox', and 'Science Publications'. Below the menu, the 'Resources for Executing your Scientific Research' section is visible, with a list of resources:

- [Program Information lookup tool](#)
- [Approved Programs by type of program](#)
- [Observing Schedules by cycle](#)
- [JWebinars](#)
- [Data Analysis Toolbox](#)
- [Science Publications](#)
- [Instructions on how to submit your newsworthy peer-reviewed paper](#)

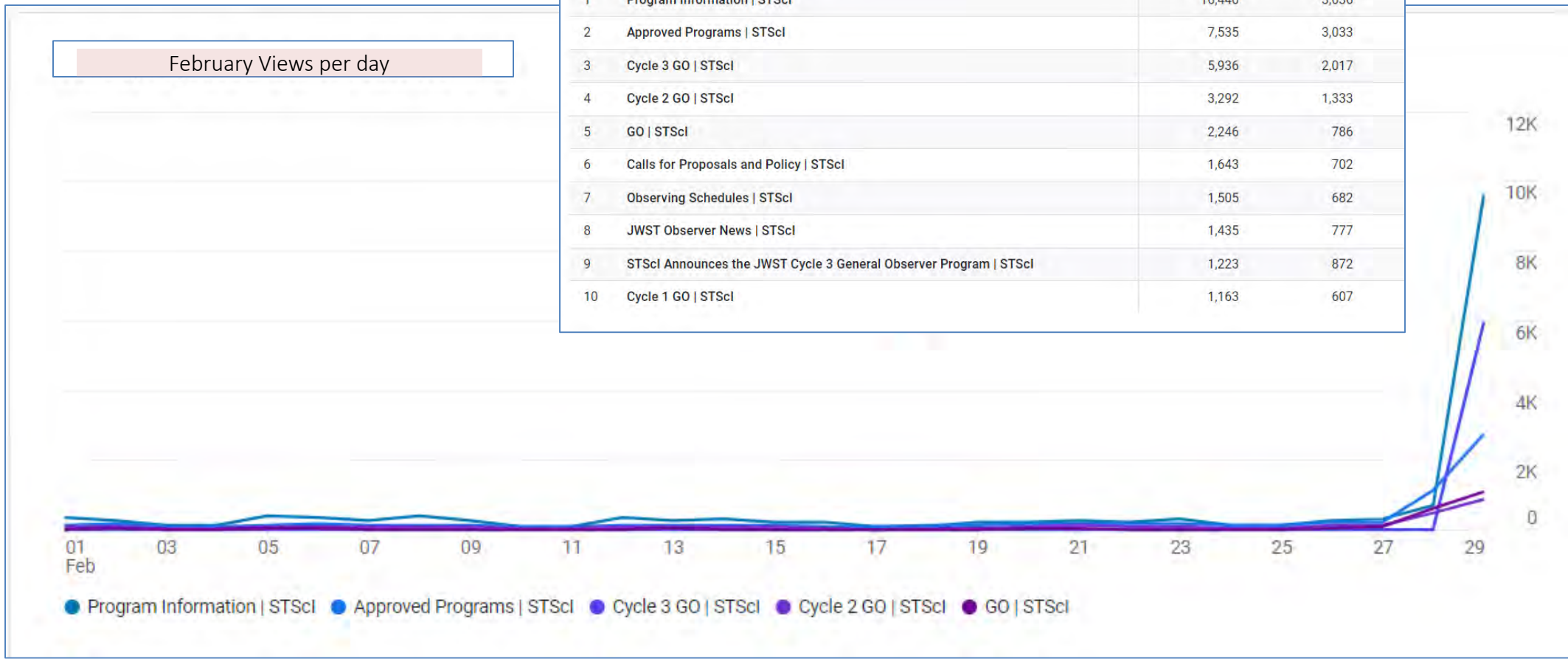


JWST Community Engagement – Observer Websites

- JWST Observer pages

Page title and screen class		↓ Views	Users
February Views		52,520	9,951
		100% of total	100% of total
1	Program Information STScI	16,440	3,036
2	Approved Programs STScI	7,535	3,033
3	Cycle 3 GO STScI	5,936	2,017
4	Cycle 2 GO STScI	3,292	1,333
5	GO STScI	2,246	786
6	Calls for Proposals and Policy STScI	1,643	702
7	Observing Schedules STScI	1,505	682
8	JWST Observer News STScI	1,435	777
9	STScI Announces the JWST Cycle 3 General Observer Program STScI	1,223	872
10	Cycle 1 GO STScI	1,163	607

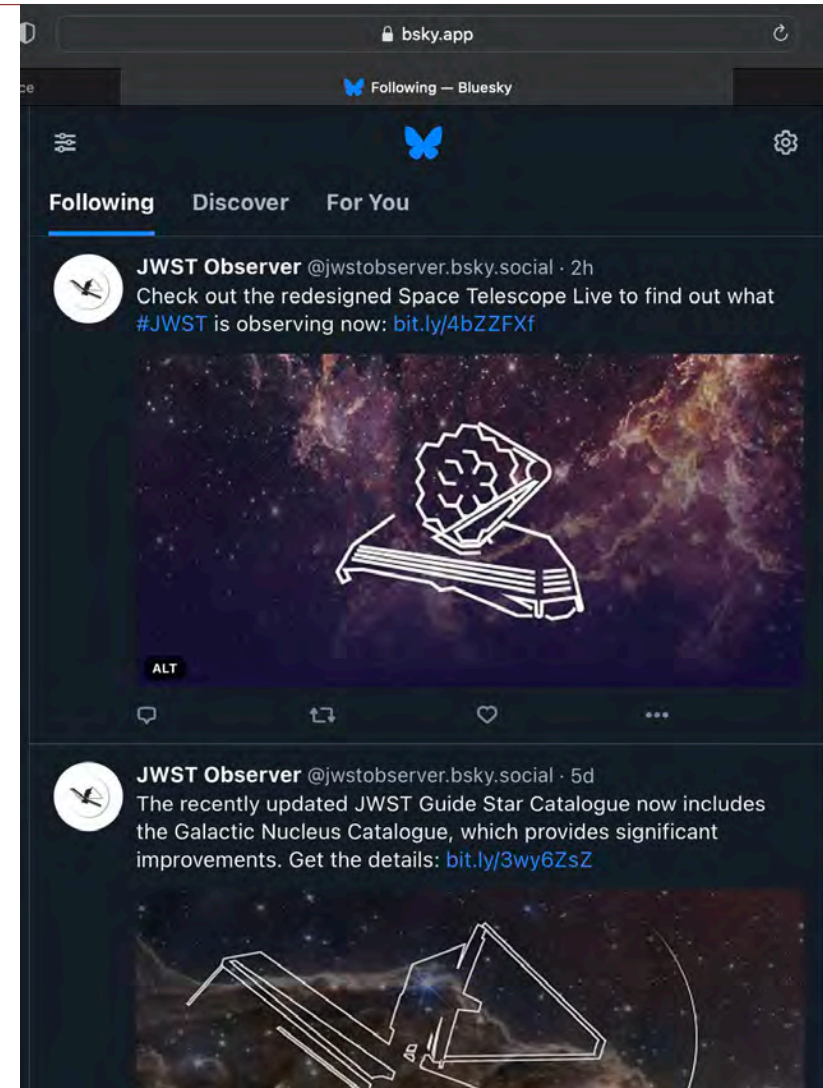
February Views per day





JWST Community Engagement – Social Media

- **JWST Observer Social Media**
 - (Separate from larger STScI and NASA JWST accounts geared toward the public)
 - New BlueSky account - 133 followers and counting!
 - 18,274 Twitter followers
 - 5,113 Facebook followers
 - 1,950 YouTube subscribers
- We share Observer News Items and Articles, Event registrations, AAS activity





JWST Community Engagement – Help Desk

- [JWST Help Desk:](#)
- Reach out to STScI
 - Ask Questions
 - Provide Feedback
 - Get Announcements & Release Notes
- We consistently encourage users to come to the Help Desk to give us real time feedback



The screenshot shows the JWST Help Desk website. At the top, there is a navigation bar with the STScI logo and the text 'JWST Help Desk'. To the right of the navigation bar are links for 'Knowledge', 'Service Portals', and 'My Open T'. The main heading is 'How can we help?' with a sub-heading 'Search JWST Knowledge Base and Documentation System (JDox)'. Below the heading is a search bar containing the text 'How can we help?'. The page is divided into two main sections: 'Knowledge Base' and 'Get Help'. The 'Knowledge Base' section includes a link to 'Browse our Frequently Asked Questions, Release Notes, and Known Issues'. The 'Get Help' section includes a link to 'Contact the JWST Help Desk to ask a question or report a pr'. Below these sections are three columns of content: 'Announcements', 'Helpful Links', and 'Abstract Submission Entry Form'. The 'Announcements' column lists three items: 'JWST Operations Pipeline Build 10.1 Released' (8d ago), 'APT 2024.1 Released' (25d ago), and 'Webb Office Hours - twice a month' (2mo ago). The 'Helpful Links' column lists four items: 'Help Desk Terms of Service', 'James Webb Space Telescope', 'JWST User Documentation (JDox)', and 'Space Telescope Science Institute'. The 'Abstract Submission Entry Form' is partially visible on the right.



JWST Community Engagement – Help Desk

How can we help?

Search JWST Knowledge Base and Documentation System (JDox)

How can we help?

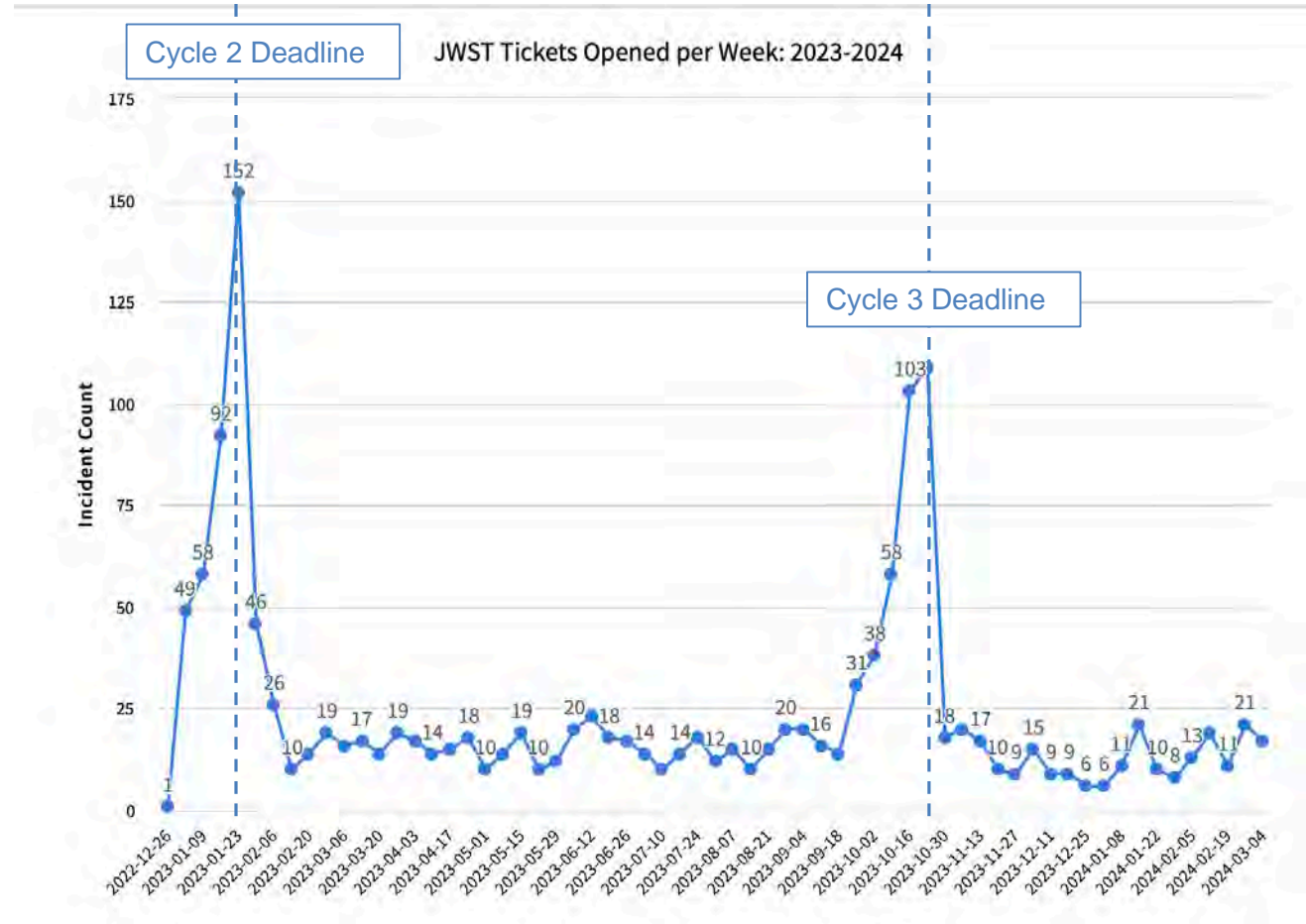


- **JWST Help Desk:**
 - Respond within 2 business days
 - Resolution may take longer depending on difficulty of question and back and forth with the user
 - Avg resolution time is less than a week from submitting (less during Proposal season)
 - Implementation and feedback to teams
 - Each ticket category has a Help Desk lead that tracks tickets and ensures feedback is reported back to their team and action items are created as necessary.
 - Feedback and FAQs from tickets are used to help prioritize the needs for Pipeline updates, JDox article creation/edits, JWWebbinar topics, example notebooks, proposal reviews, etc.



JWST Community Engagement – Help Desk

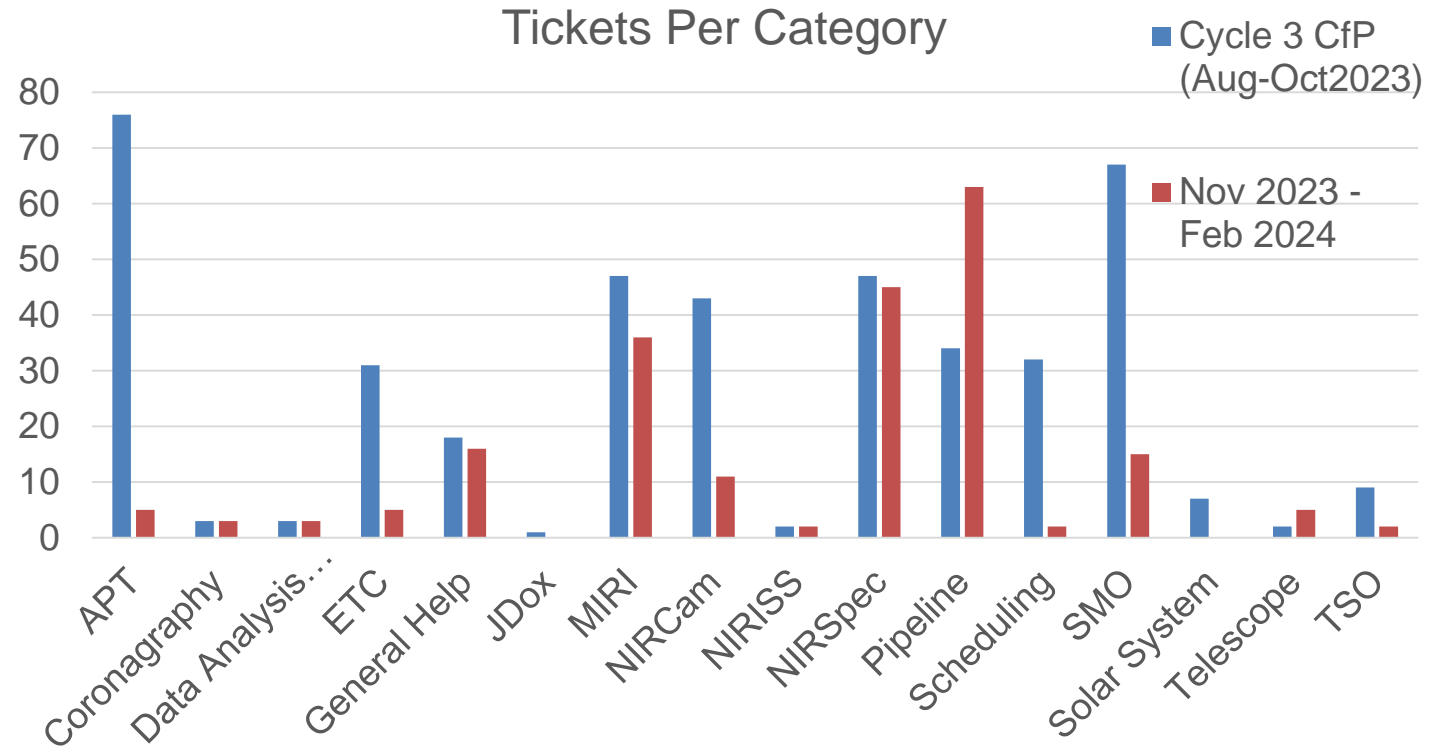
- **JWST Help Desk:**
 - Avg 14 tickets per week (in non-call for proposal periods)
 - Most active during Call for Proposals period





JWST Community Engagement – Help Desk

- **JWST Help Desk Usage:**
 - Cycle 3 Call for Proposals period (Aug- Oct 2023):
 - 422 tickets
 - questions skew towards APT, SMO
 - 295 Unique Users
 - Normal Operations from Nov 2023 – Feb 2024:
 - 213 tickets
 - Pipeline accounts for 30% of tickets
 - 152 unique users
 - Historical unique users: 1,325





JWST Community Engagement – PI unique needs

- **Individualized Communication with PIs**
 - PIs are directly contacted when there is specific news/updates related to their observations
 - E.g. guide star failure, observations during a tilt event, etc (See M. Garcia Marin's S&OC presentation on WOPRs, PCR's)
 - Instrument Scientists and Schedulers available as needed
 - Dedicate time and effort to unique needs of each PI during program review process
 - Direct email access throughout the cycle
- Guider teams support PIs to help select and vet the guide stars