



Science Policy

Neill Reid
SMO

STUC: 12 May 2016

Outline

- Mid-Cycle proposals
- HST & JWST in 2018
- Adjusting the HST TAC Process
- Proposal systematics
- Summary

Mid-Cycle Proposals



STUC: 12 May 2016

Mid-Cycle proposals

Introduced in Cycle 23

- Aim to provide a mechanism for responding quickly to new discoveries

Proposals are required to meet the following criteria:

- Could not have been submitted in the most recent standard call
- Scientifically urgent
- Limited to ≤ 5 orbits, minimal constraints
- Up to 200 orbits made available

Proposals rolled up for review twice a year

- October 1, reviews completed by November 23
- January 31, reviews complete by March 7

Proposals graded on an absolute scale by external reviewers

- Generally drawn from Cycle 22 & 23 TACs
- 4-5 reviewers solicited for each proposal
- Standard format reviews: scientific merit, importance to astronomy, urgency & unique to HST
 - Generally good agreement among reviewers
- Grades combined by SPG staff for Directors review

Mid-Cycle 23 responses

October 2015 review

- 46 proposals submitted by midnight, October 1
 - Total of 174 orbits requested
- 38 proposals sent for review (33 male PI, 5 female PI)
 - 13 Approved for 52 orbits (11 male PI, 2 female PI); all were executed by March 2016

	AGN	COS	CS	DEB	EXO	HS	IEG	ISM	RSF	RSP	SS	USP
Sub	5	6	1	2	12	4	4	1	2	1	3	4
App	1	1	1	0	5	1	1	0	2	0	1	0

February 2016 review

- 29 proposals submitted by midnight, January 31
 - Total of 117 orbits requested
- 28 proposals sent for review (25 male PI, 3 female PI)
 - 9 Approved for 34 orbits (8 male PI, 1 female PI)

	AGN	COS	CS	DEB	EXO	HS	IEG	QAL	RSF	RSP	SS	USP
Sub	3	2	0	0	4	1	2	2	2	0	5	7
App	0	1	0	0	1	0	1	1	1	0	3	1

Cycle 24

We propose to continue issuing Mid-Cycle calls in Cycle 24

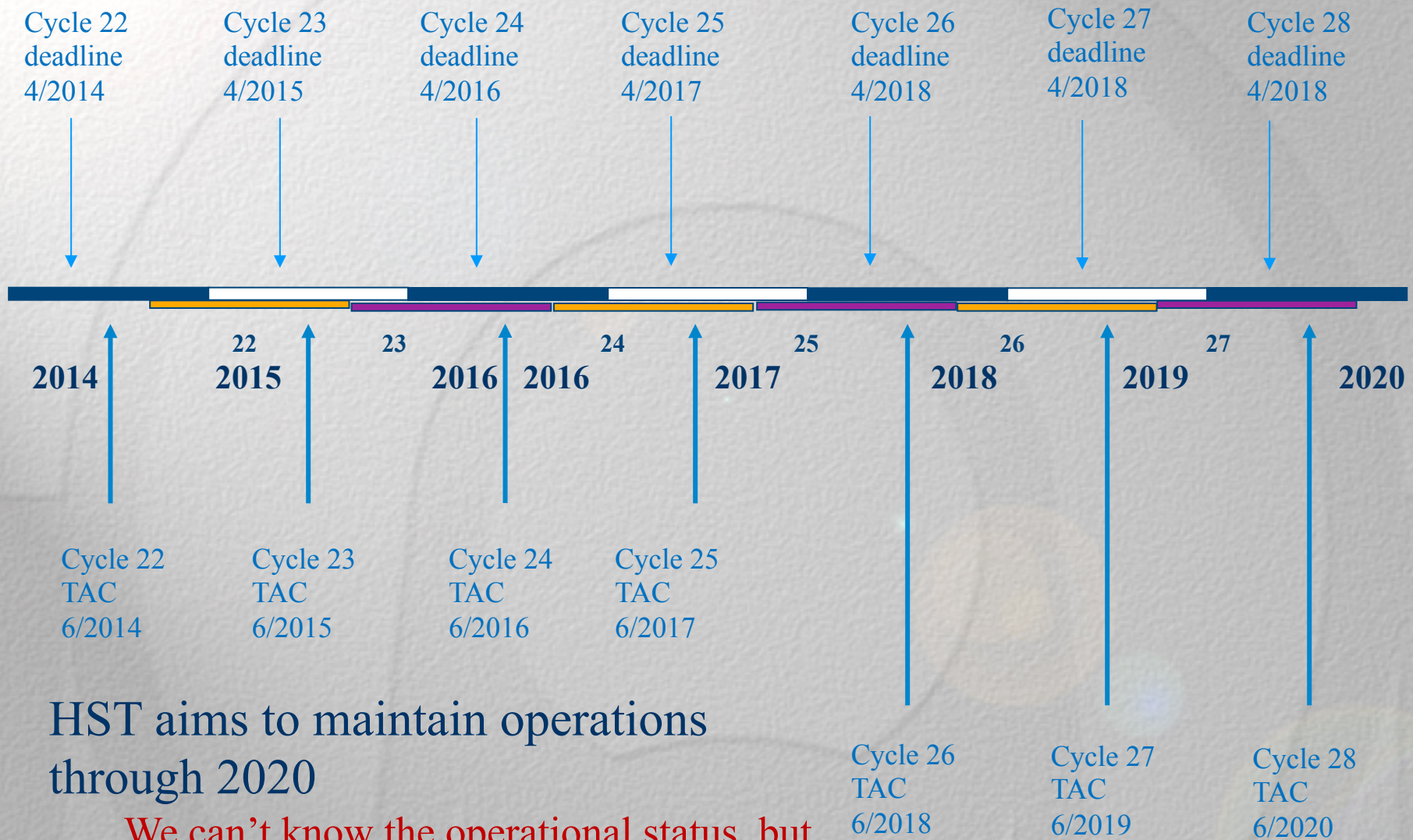
- Proposal deadlines will be set at September 30 & January 31
 - First deadline moved forward in part to balance the distribution through the year
 - 5 months after Cycle 24 deadline
 - 5 months before second mid-cycle deadline
 - Gives more separation from prime NSF deadline
- We are considering changing the limits on proposal size
 - Current limit constrains on the science that can be achieved
 - Propose changing the criterion to “ Proposals are generally limited to 5 orbits or fewer; under exceptional circumstances, and with the appropriate justification, proposers may request up to 10 orbits.”
 - Other criteria unchanged
- Review process
 - In Cycle 24 we will invite the TAC Chair to participate in the final review

HST & JWST TAC processes 2018



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Taking the long view

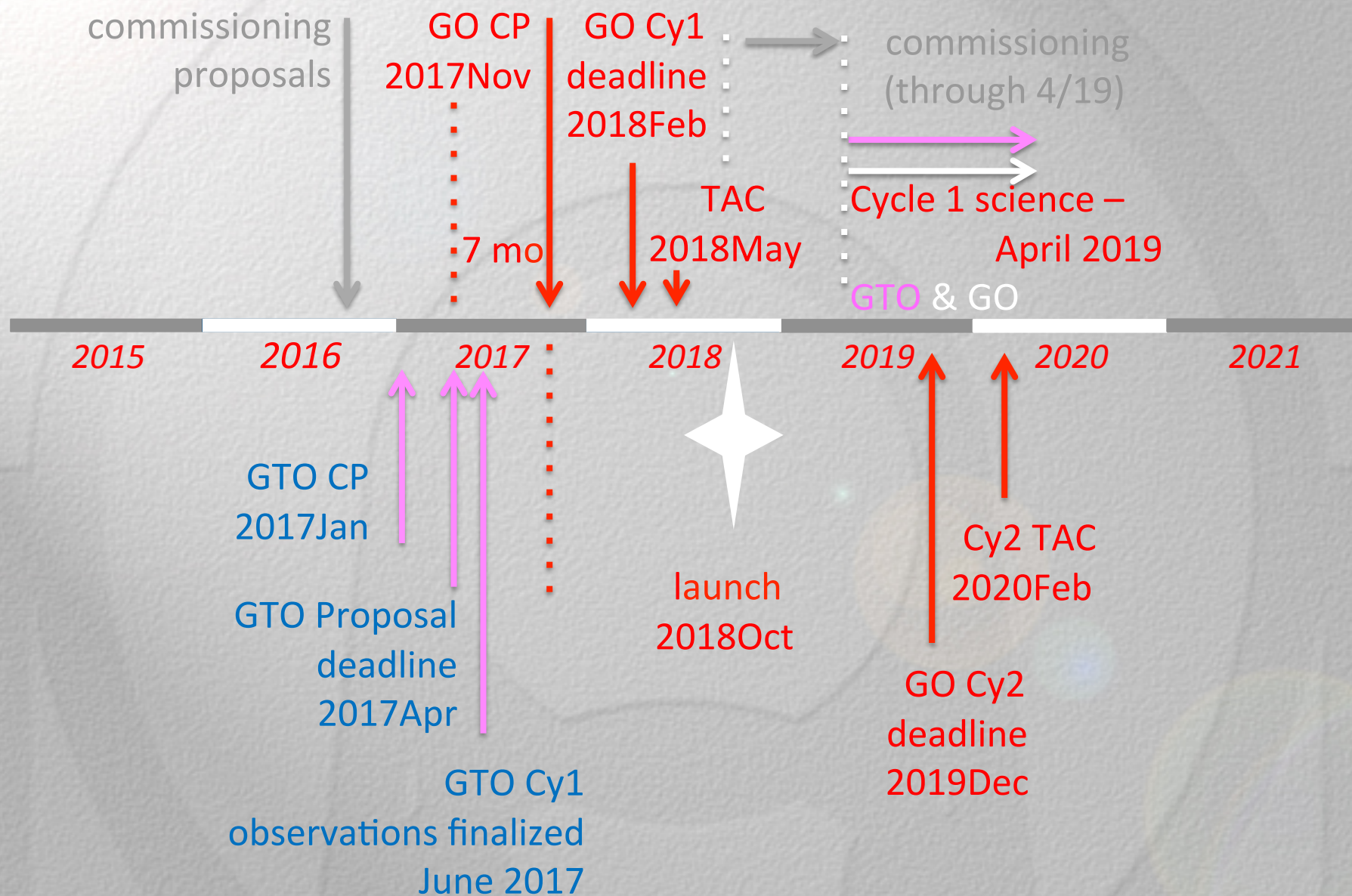


HST aims to maintain operations through 2020

We can't know the operational status, but need to plan for a best case scenario

JWST Science Planning Timeline

(draft schedule as of May 2016)



Baseline HST & JWST GO proposal schedules

HST

Cy25
deadline
4/2017

TAC
6/17

Cy26
deadline
4/2018

TAC
6/18

Cy27
deadline
4/2019

TAC
6/19

Cy28
deadline
4/2020

TAC
6/20

2016

2017

2018

2019

2020

TAC
5/2018

GO Cy1
deadline
2/2018

GO Cy2
deadline
12/2019

TAC
2/2020

launch
2018Oct

JWST

Logistics

- Running the JWST and HST TACs back-to-back would likely to lead to significant challenges
 - Proposal ingest
 - Proposal review
 - Program scheduling
 - Budget submission, review & grant allocation
- We established a working group to review options
 - Includes representatives from STScI (science policies, HSTMO, JWSTMO, PPS, scheduling, grants), HST Project & JWST Project
 - The working group has examined the proposal submission & review schedules, and the implications for scheduling and executing observing programs, and has considered options for streamlining the review process
 - The results are summarised in a white paper

Constraints

- **Mission status**
 - HST is an operating mission
 - JWST is in development
 - Tighter constraints on adjusting the JWST schedule
 - Especially moving dates earlier
- **Proposal submission processes**
 - HST Proposal submission is 2-phase (I, II),
 - Budgets submitted with Phase II
 - JWST proposal will be single stream
 - Aim for LRP-ready submission of simple proposals
 - Likely to be significant exemptions for JWST Cycle 1
 - Proposers will likely have ~1-2 months after acceptance to finalise exempted proposals – so effectively a 2-step process in Cycle 1
 - No joint observatory proposals in Cycle 1

Guidelines

- Don't make radical changes that break what's working
- Learn from experience
 - E.g. Mid-cycle proposals
- Build synergies between HST and JWST
- Distribute the pressures on the community and STScI as evenly as possible – minimise the peaks in activity

Baseline HST & JWST GO proposal schedules

HST

Cy25
deadline
4/2017

TAC
6/17

Cy26
deadline
4/2018

TAC
6/18

Cy27
deadline
4/2019

TAC
6/19

Cy28
deadline
4/2020

TAC
6/20

2016

2017

2018

2019

2020

TAC
5/2018

GO Cy1
deadline
2/2018

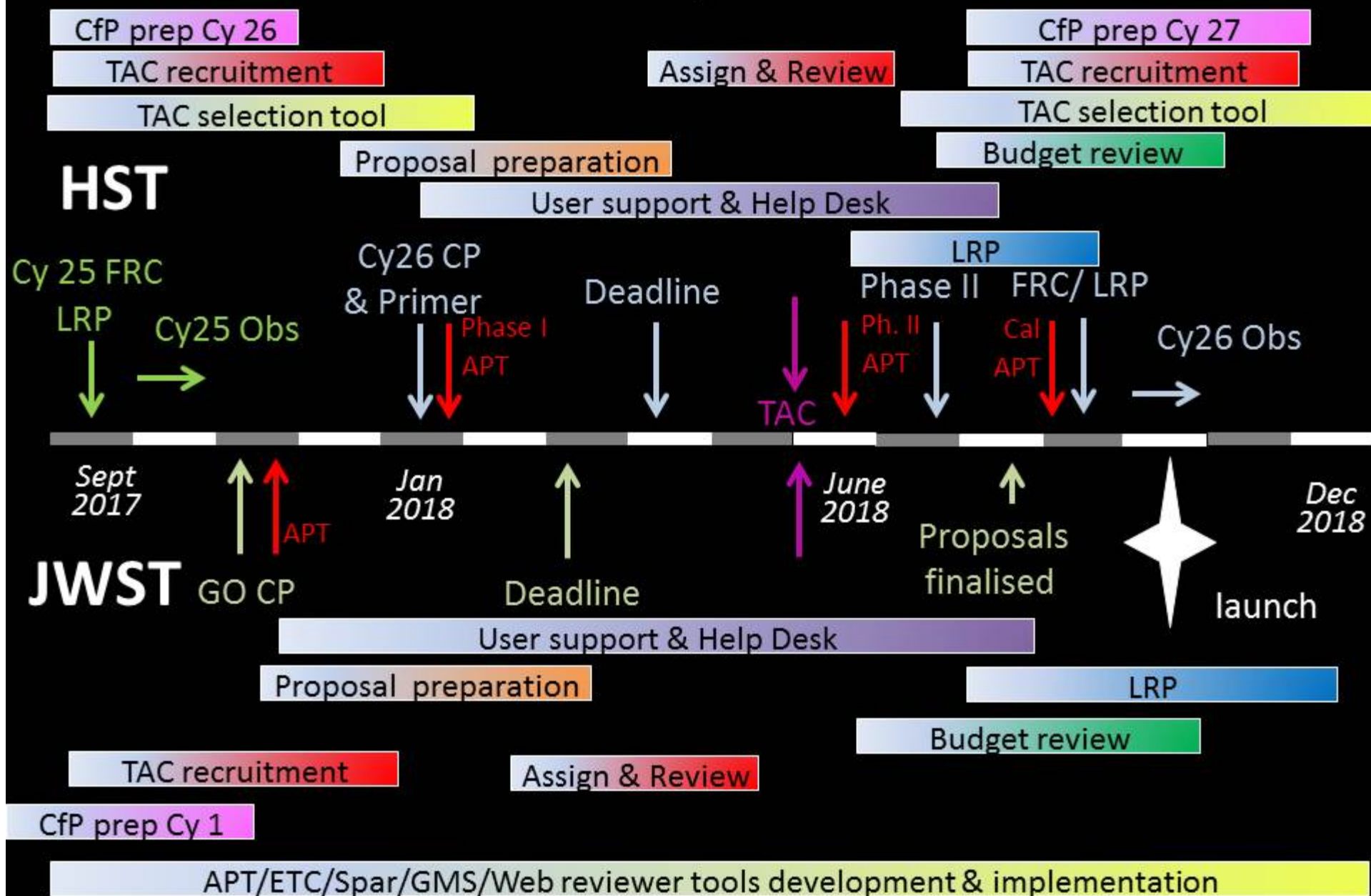
GO Cy2
deadline
12/2019

TAC
2/2020

launch
2018Oct

JWST

Consolidated Proposal Schedules



Baseline schedule: pros and cons

Advantages:

- Scheduling: Work effort in developing HST and JWST LRPs in well phased

Challenges:

- TAC Recruitment – need to attract 250-300 community members to serve on 2 TACs within 1 month span
 - JWST Cycle 1 TAC will likely be more attractive than HST Cycle 26
 - Chandra Cycle 20 TAC and ALMA Cycle 6 TAC also in June
- No opportunity to propose substantial HST programs to complement and supplement Cycle 1 JWST programs until Cycle 27 TAC in 2019
- Proposal preparation – closely spaced TAC deadlines will tax the community
 - ALMA and Chandra deadlines are also in April
- TAC support – 2 major TACs within 1 month will tax STScI

Neutral:

- Grants – overlapping schedules, but likely sufficient flexibility with JWST schedule

Restructuring the schedule

The working group considered four options:

1. Merge the HST & JWST TACs
2. Move the HST Cycle 26 TAC process earlier
3. Move the HST Cycle 26 TAC process later
4. Restructure the Cycle 25/26 allocation processes

Option 4 is the most promising

Restructuring Cycles 25 & 26

- Minimise HST activities in 2018 → reduce the overall workload in that year for the community and for STScI
 - Pre-allocate Cycle 26 orbits @ Cycle 25 TAC
 - Allocate ~4600 orbits @ 2017 Cycle 25 TAC
 - Orbit allocation for each panel increased by 50%
 - All proposals selected must be deemed worthy of HST time
 - » Panels consistently indicate they are willing to select twice as many programs as they have orbits to support
 - Retain ~600 orbits for 3-4 mid-cycle opportunities
 - Limited to proposals for <10 orbits
 - Allocate ~1100-1200 orbits at Cycle 26 Δ TAC in 9/2018
 - Limited to medium and large proposals
 - Focus on supplementing accepted JWST Cycle 1 programs
 - Revert to current HST schedule in 2019 (Cycle 27)
 - Minimal adjustments to the JWST process

Pre-allocate Cycle 26: 4

HST

Cy25
deadline
4/2017

TAC
6/17

Cy26 Δ TAC
deadline
7/2018

Δ TAC
9/18

Cy27
deadline
4/2019

TAC
6/19

Cy28
deadline
4/2020

TAC
6/20

2016

2017

2018

2019

2020

Call
11/2017

TAC
5/2018

GO Cy1
deadline
2/2018

GO Cy2
deadline
12/2019

TAC
2/2020

launch
2018Oct

JWST

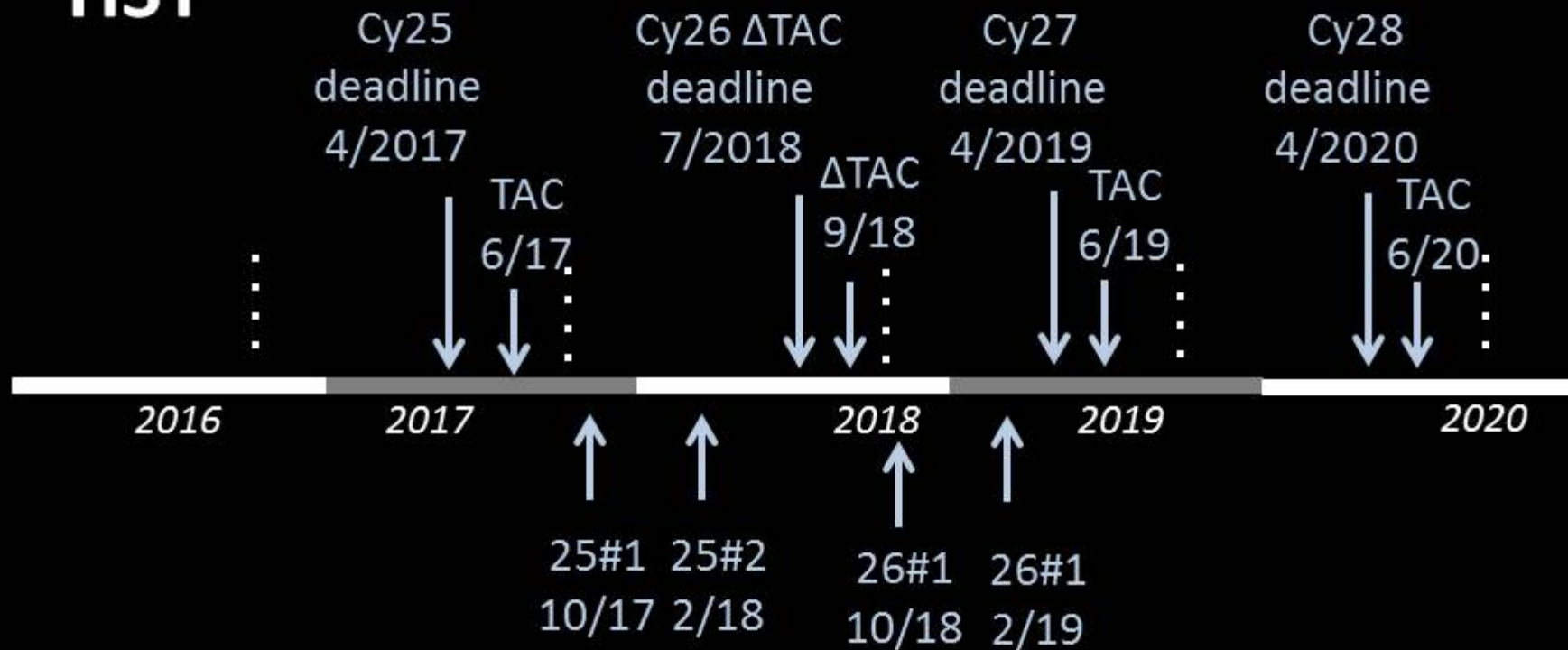
Restructured Cy 25/26: pros and cons

Advantages:

- Reduces overall workload for STScI and the community in 2018
 - Anticipate ~200 proposals for Δ TAC \rightarrow ~5 TAC panels, ~45 TAC members
- Clear separation between HST and JWST timelines
- Opportunities for larger-scale programs in combined Cy 25/26 allocation
- Builds synergies with JWST by providing an opportunity to propose HST observations that complement approved JWST Cycle 1 programs
 - Mid-cycles for small proposals, Δ TAC for larger proposals

Pre-allocate Cycle 26

HST



Anticipate significant
number of JWST-
related proposals

Mid-cycle

launch
2018Oct

Restructured Cy 25/26: pros and cons

Advantages:

- Reduces overall workload for STScI and the community in 2018
 - Anticipate ~200 proposals for Δ TAC \rightarrow ~5 TAC panels, ~45 TAC members
- Clear separation between HST and JWST timelines
- Opportunities for larger-scale programs in combined Cy 25/26 allocation
- Builds synergies with JWST by providing an opportunity to propose HST observations that complement approved JWST Cycle 1 programs
 - Mid-cycles for small proposals, Δ TAC for larger proposals

Challenges:

- TAC Recruitment for the Cy 26 Δ TAC
 - Overlaps with the start of the school year, but smaller scale than the traditional TAC
- Scheduling
 - Initial (8/2017) HST LRP will need to extend through ~July 2019
 - Programs selected by Cycle 25 Tac and the Cycle 26 Δ TAC will need to reflect the non-uniform sky coverage for available programs.

Which proposals are selected for scheduling in “Cycle 26”?

Scientific urgency:

- Based on recommendations by the TAC
- Ask panels to rank proposals with higher potential impact in the top 2/3rd
 - But setting additional priorities is likely to impact the overall scheduling efficiency

Scheduling alone:

- Use the target distribution to dictate when the observations are taken
 - Effectively consider all observations selected in 2017 as Cycle 25

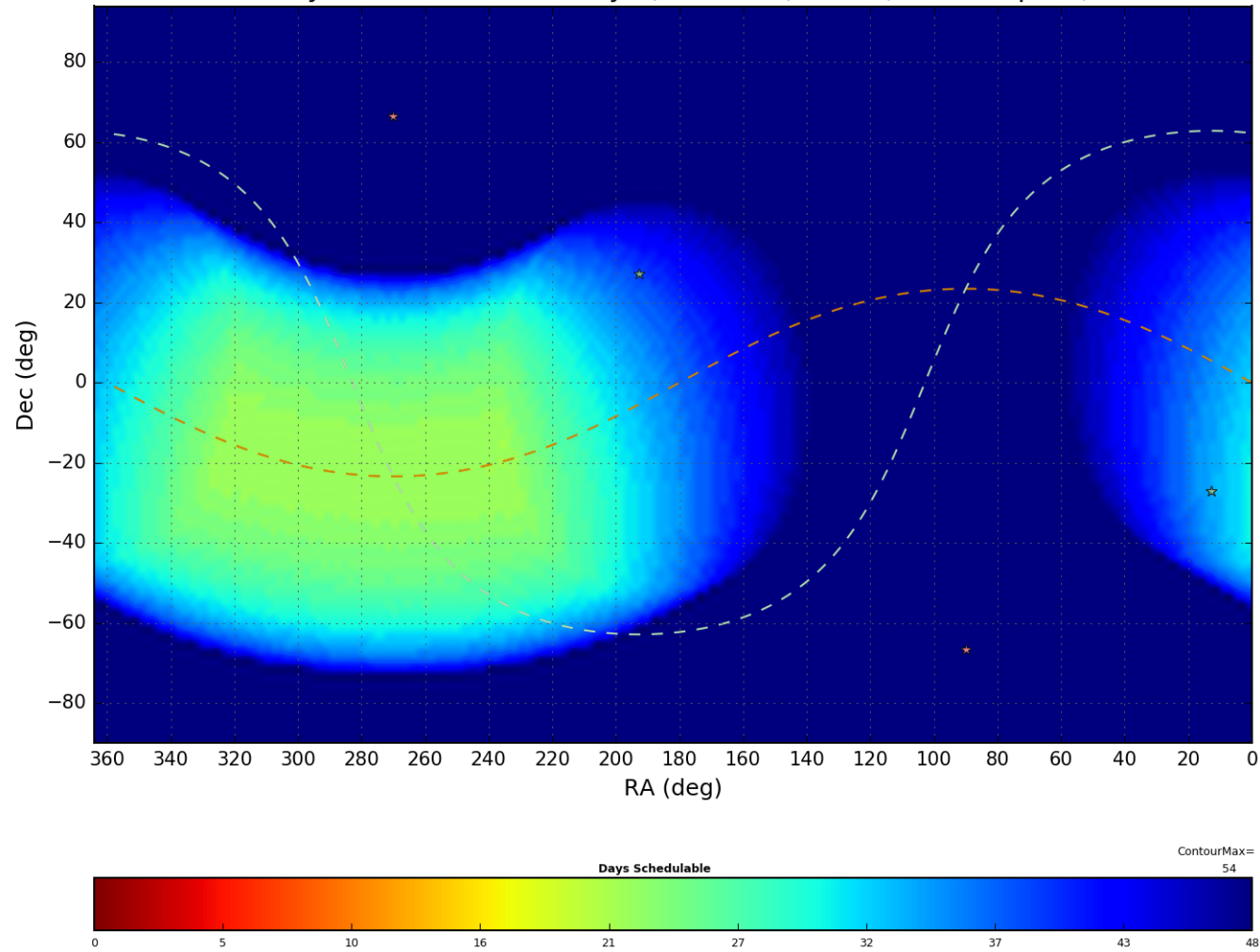
All proposals selected must be deemed worthy of HST time

- Panels consistently indicate they are willing to select twice as many programs as they have orbits to support

Sky coverage: October-March

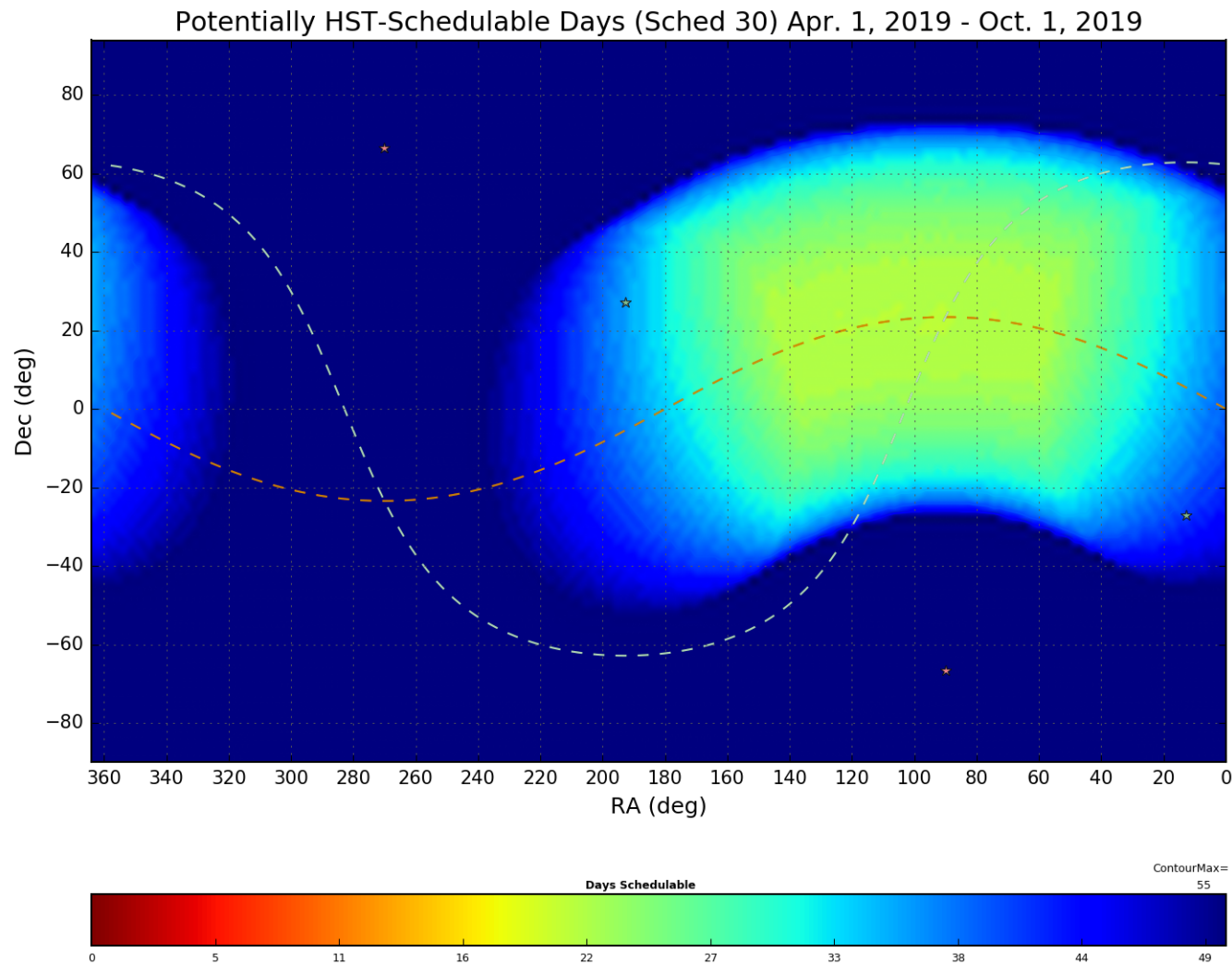
Favours Galactic anti-centre

Potentially HST-Schedulable Days (Sched 30) Oct. 1, 2018 - Apr. 1, 2019



Sky coverage: April-September

Favours Galactic centre



Restructured Cy 25/26: pros and cons

Advantages:

- Reduces overall workload for STScI and the community in 2018
 - Anticipate ~200 proposals for Δ TAC \rightarrow ~5 TAC panels , ~45 TAC members
- Clear separation between HST and JWST timelines
- Opportunities for larger-scale programs in combined Cy 25/26 allocation
- Opportunity for HST proposals to complement approved JWST programs
 - Mid-cycles for small proposals, Δ TAC for larger proposals

Challenges:

- TAC Recruitment for the Cy 26 Δ TAC
 - Overlaps with the start of the school year, but smaller scale than the traditional TAC
- Scheduling
 - Initial (8/2017) HST LRP will need to extend through ~July 2019;
- Grant funding
 - Specifying programs as Cycle 25 or 26 simplifies initial allocations
 - Efficient scheduling may demand that programs nominally allocated to Cycle 26 are executed in Cycle 25 – need to identify a mechanism for funding those programs

Adjustments:

- Documentation: Issue a Δ CP and Δ Primer prior to the Δ TAC call
 - Limited to updates on Cycle 25 materials

Adjusting the HST TAC Process



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Adjusting the HST TAC process

The working group also discussed options for streamlining the HST TAC process:

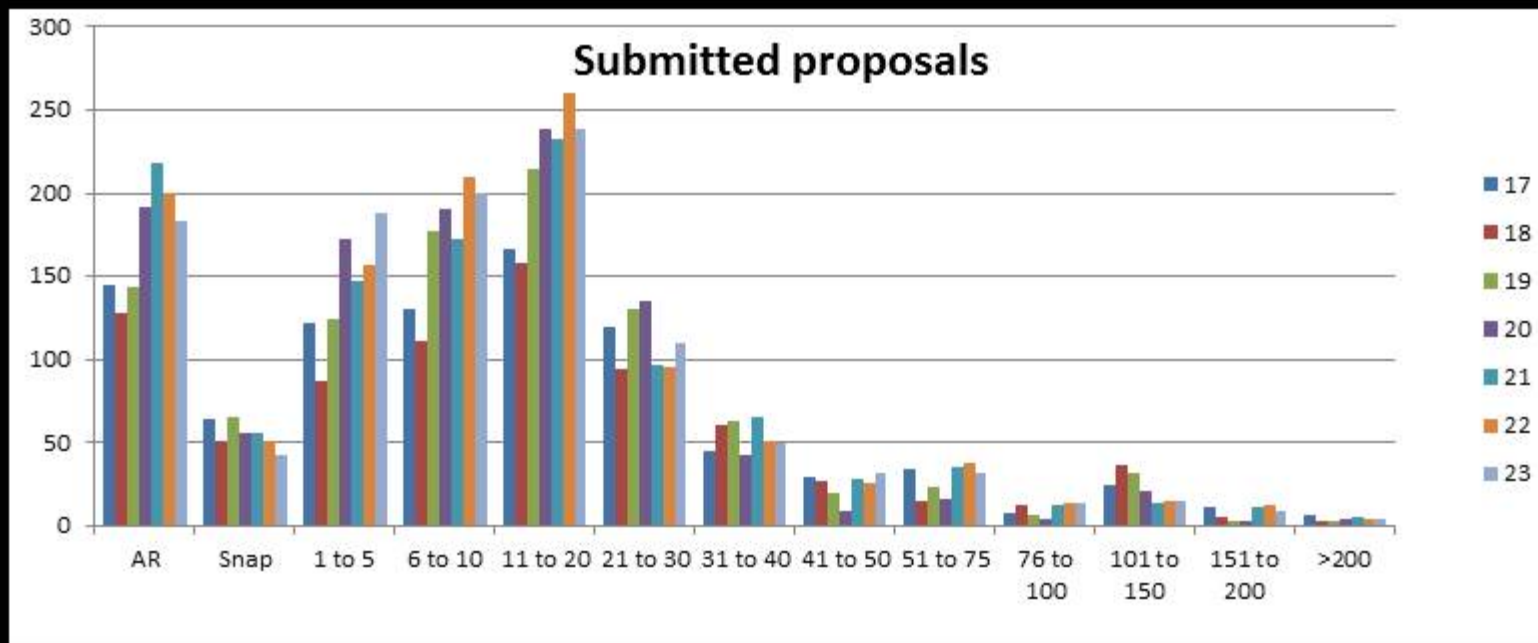
A. Move to a “rolling” TAC

- Accept proposals for review throughout the year rather than have fixed deadlines
 - Resonates with recent NSF analysis on reducing proposal pressure by eliminating deadlines
- There are significant complications
 - Increased workload on schedulers in continuously updating the LRP
 - Strong probability of decreased efficiency through incomplete sky coverage at any given time
 - Limits the pool of pre-reviewed programs that can be accessed in emergencies (eg instrument failures)

B. Reduce the scale of the on-site HST TAC

- Use a different review process for smaller-scale proposals

HST proposal – size distribution



- Size distribution of submitted HST proposals
 - $\sim 400 \leq 10$ orbits $\rightarrow \sim 37\%$
 - $\sim 600+ \leq 20$ orbits $\rightarrow \sim 55\%$

Reviewing small proposals

- A. Use preliminary grades as primary selection process for smaller proposals ($N \leq p$ orbits)
 - Limit panel discussions to highest ranked proposals → effectively sets a triage limit of ~60-70% for small proposals
 - Has the potential to limit on-site discussions, but doesn't reduce the pre-TAC workload for panelists
- B. Rank smaller proposals ($N \leq p$ orbits) through a separate process based on grades submitted by external reviewers; limit on-site discussion to proposals ($N > p$ orbits)
 - Fewer proposals to discuss, so fewer panels, fewer TAC members, shorter meeting
 - Mid-cycle reviews suggest that the process is conceptually feasible, but would need to operate on a much larger scale
 - Requires the development of appropriate grading tool
 - ~4-5 reviews of 400+ proposals → at least 2000 sets of grades
 - Requires a mechanism for informing panels of the results of external review

Option B offers the potential to reduce (or disperse) the community workload

Implementation

Option B has three key requirements:

- Adapt the proposal review tools to distribute proposals and collect grades from 300+ reviewers
- Build understanding in the community for the review process
- Develop a pool of ~300-400 reviewers

Unlikely to be satisfied for the Cycle 25 TAC

- ➔ Maintaining the mid-cycle proposals through Cycles 24-26 will allow us to develop & test the proposal review tools and build a broader community of reviewers
- ➔ Target the Cycle 27 TAC (2019) for implementing the re-structured review process

We will continue to explore these options and invite feedback from the STUC



Proposal systematics

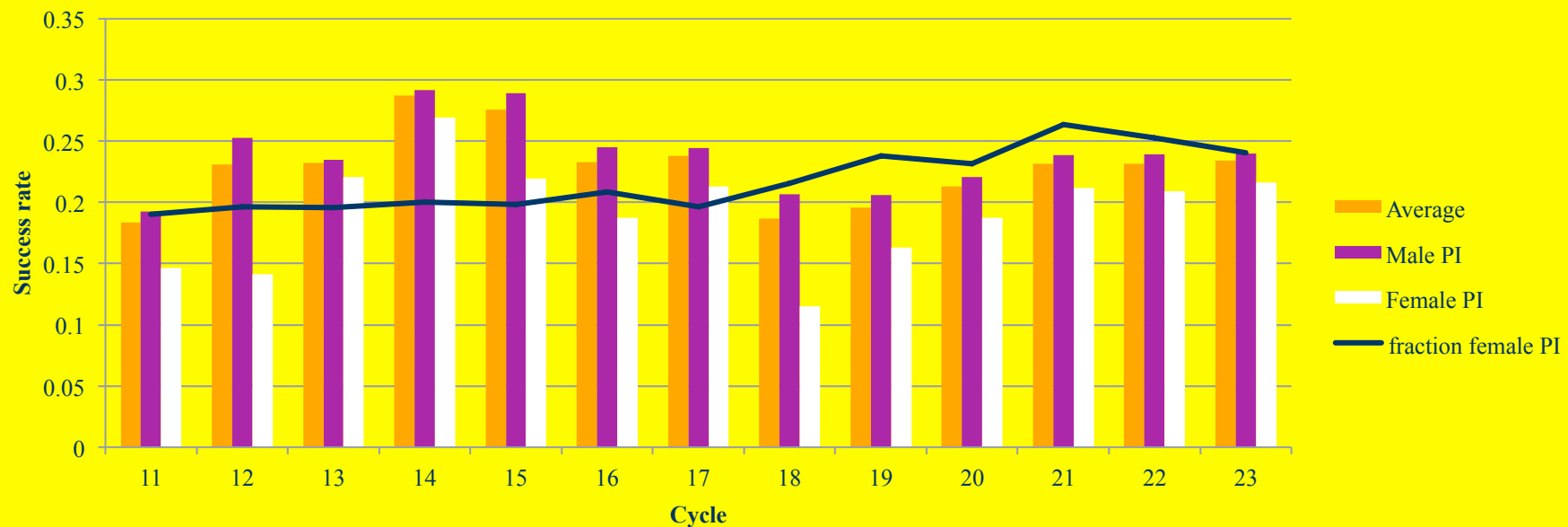
Gender correlated systematics

Analyses show a statistically significant offset in the success rates of proposals led by male and female PIs

This isn't just about gender – gender is something that we can measure

Unexpected results might be indicative of other subjective systematics

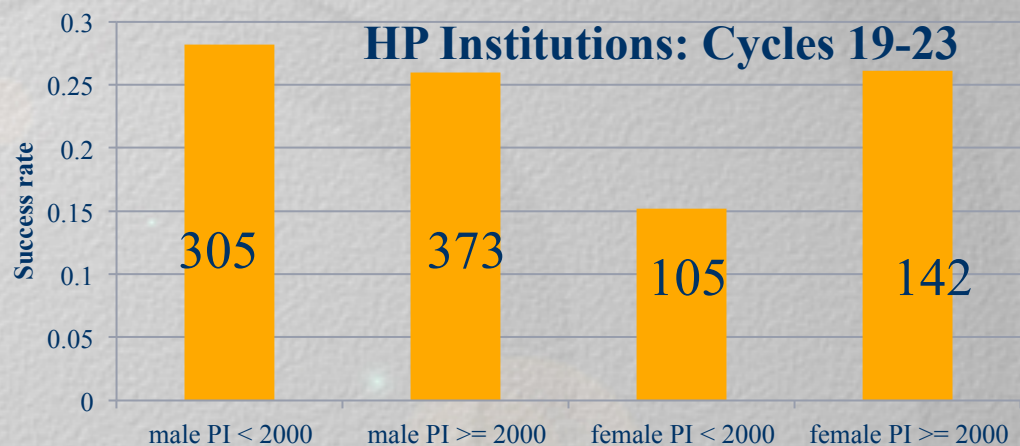
Look at this as the canary in the coalmine...



Statistics for “HP” Institutions

Last November, we pulled out statistics for researchers at “high profile” institutions

- Relatively homogeneous institutions
- 927 proposals
- Clear deficit for proposals with senior female PIs



Follow-up questions:

- Can the seniority statistics be sub-divided further?
- Is there a correlation between team size and PI gender?
- Is there a correlation between success rate and the subject?

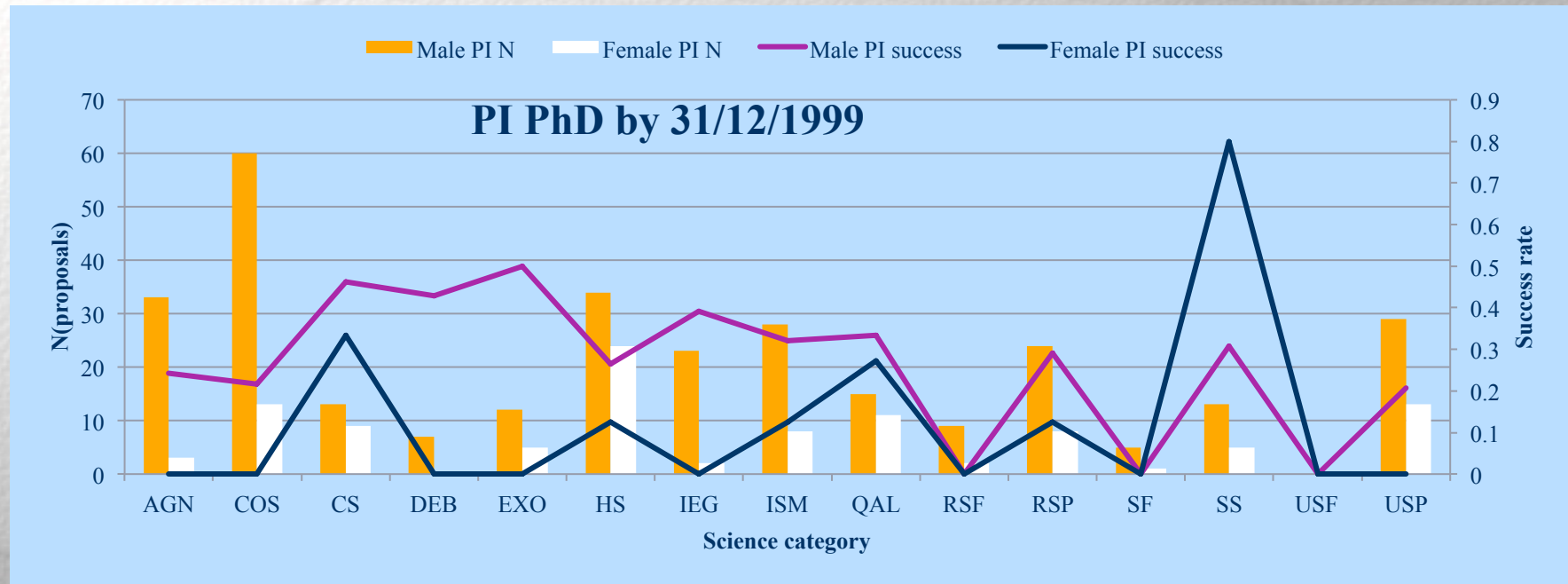
Team size

All	N(prop)	<male co-I>	<female co-I>	<all co-I>
Male PI < 2000	432	4.61	1.00	6.62
Male PI ≥ 2000	335	4.99	1.16	7.16
Female PI < 2000	106	4.09	1.56	6.66
Female PI ≥ 2000	134	3.75	1.30	6.05
Approved				
Male PI < 2000	96	5.06	1.10	7.17
Male PI ≥ 2000	63	5.72	1.25	7.97
Female PI < 2000	13	3.38	1.31	5.69
Female PI ≥ 2000	26	4.27	1.23	6.5

Does the average number of co-Is vary based on PI gender?

Data from Cycle 20: No obvious trends

Science category



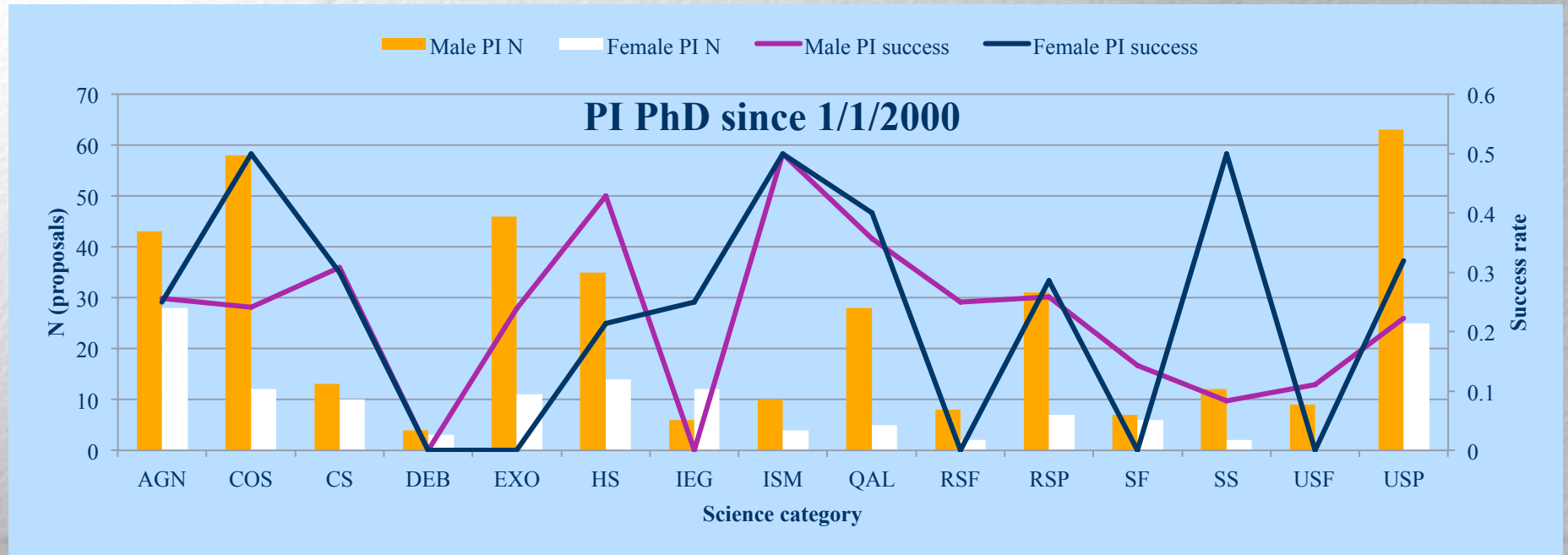
Histogram – number of proposals

Line – Acceptance rate:

If the purple line is above the blue line, male PIs have a higher acceptance rate in that category;

This circumstance holds for every subject except Solar System.

Science category



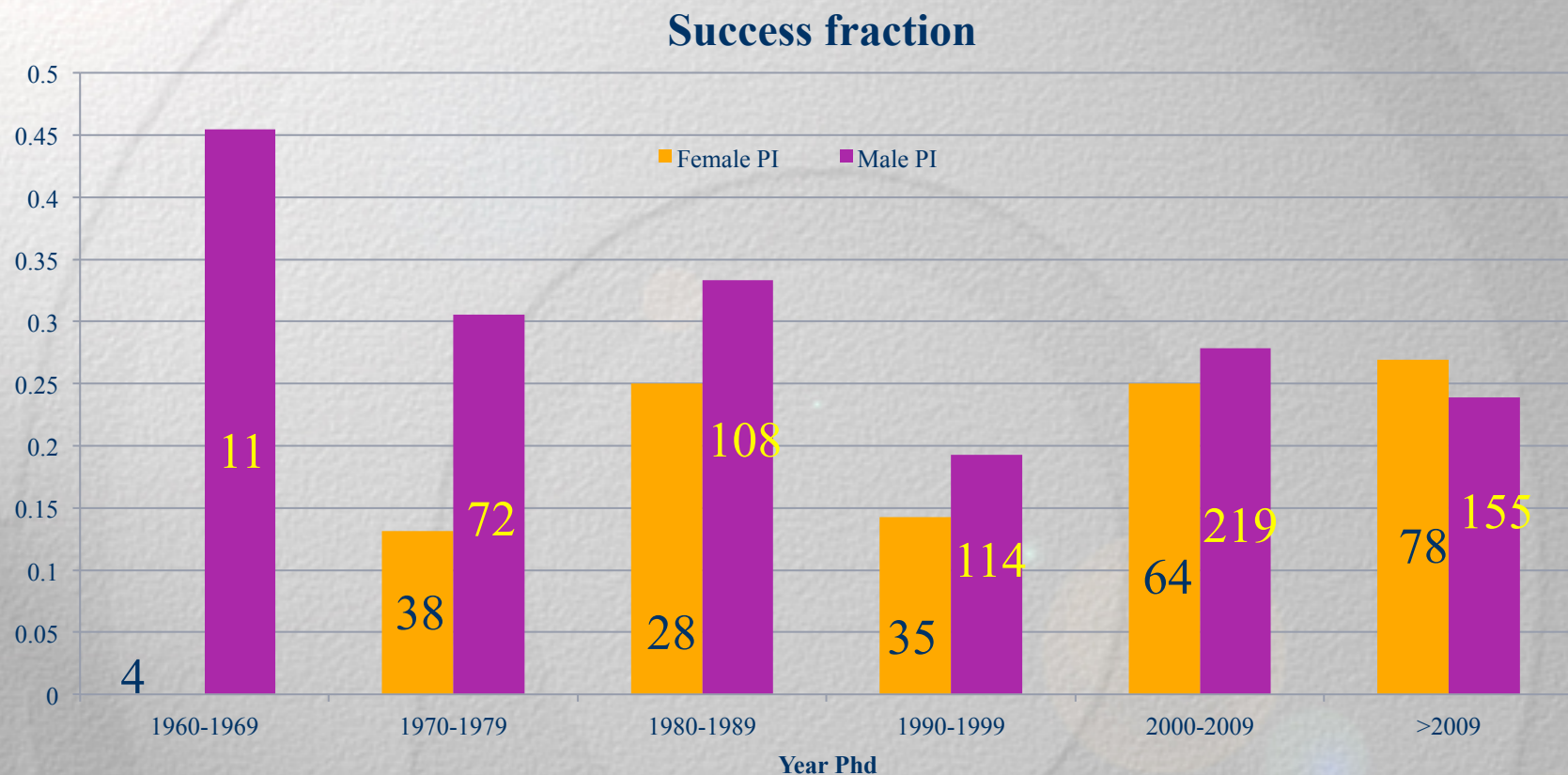
Histogram – number of proposals

Line – Acceptance rate:

If the purple line is above the blue line, male PIs have a higher acceptance rate in that category;

Results are mixed – 5 male, 6 female, 4 tied

Seniority



Results suggest a trend with seniority in female-PI proposals
Less evident in male-PI proposals

Summary

- Mid-cycle proposals
 - Process has been successful in bringing in topical proposals over a wide range of subject areas
 - We propose to retain the program for Cycle 24 with increased the orbit limits, but the same constraints on topicality
- HST & JWST in 2018
 - We propose to restructure to Cycle 25 & 26 HST TAC processes to reduce HST-related activities in 2018, while enhancing the opportunity to propose HST observations that complement & supplement JWST Cycle 1 accepted programs.
- Streamlining the TAC process
 - Two options under consideration for reviewing smaller proposals
- Demographics
 - Unconscious bias may be present in proposal selection, but is likely more complex than simple gender bias

We invite feedback from the STUC on these topics

Backup

STUC: 12 May 2016

40

Mid-Cycle proposals: criteria

Announced in early August 2015

Proposals are required to meet the following criteria:

- Could not have been submitted in the most recent standard call
- Scientifically urgent

In addition,

- Proposals are limited to requesting no more than 5 orbits;
- Observations should have minimal constraints to maximize scheduling flexibility;
- Observations taken for accepted programs will have a proprietary period of no more than 3 months;
- Proposers may apply for all available instruments. Proposals must be compliant with the technical restrictions described in the Cycle 23 Call for Proposals.
- Up to 200 orbits available for this program

Proposals rolled up for review twice a year

- October 1, reviews completed by November 23
- January 31, reviews complete by March 7

Mid-Cycle proposals: review

- Reviewers drawn primarily from Cycle 22 or 23 TACs
 - Request four reviewers per proposal
 - No more than 4 proposals per reviewer
- Standard format for review

Please answer the following questions. Grades should be assigned on a scale of 1 to 5 (integer values only), where

- 1 = Excellent 2 = Very Good 3 = Good 4 = Fair 5 = Poor
- What is your assessment of the scientific merit of the proposed and its potential contribution to the advancement of scientific knowledge
 - Grade:
- What is your assessment of the program's overall importance to astronomy?
 - Grade:
- What is your assessment of the scientific urgency of the observations?
 - Grade:
- Can the program science goals be achieved only through observations with Hubble Space Telescope?
 - Yes/No
 - If No, please specify the alternative source of observations.
- Please provide brief feedback on the main factors of the proposal that support the grades selected above:
- Grades combined and assessed by SPD staff
 - In both reviews, the grades were broadly consistent among the reviewers

HST/JWST TAC Working group

- Jennifer Wiseman, Ken Carpenter, Patricia Boyd (HST Project GSFC),
- George Sonneborn (JWST Project GSFC),
- Dave Adler, Maria Bertch, Brett Blacker, Rob Douglas, Andrew Fruchter, Sherita Hanna, Rob Hawkins, Helmut Jenkner, Vicki Laidler, Janice Lee, Alisa Meizlish, Klaus Pontoppidan, Neill Reid, Tony Roman, Paula Sessa, Denise Taylor, Bill Workman

Option 1: Consolidated TAC

- Consolidate the HST and JWST time allocation processes into a single TAC meeting
 - Retain separate HST & JWST proposal deadlines
 - JWST deadline in March 2018
 - HST deadline in April 2018
 - TAC in June 2018
 - Smaller HST proposals (<10-15 orbits) might be reviewed through a separate process
 - Remove ~400+ proposals from the on-site panel review
 - External written grades – 4-5 per proposal?
 - Small (~4 person) virtual panels?

Consolidated proposal schedules: 1

HST

Cy25
deadline
4/2017

TAC
6/17

Cy26
deadline
4/2018

Call

TAC
6/18

Cy27
deadline
4/2019

TAC
6/19

Cy28
deadline
4/2020

TAC
6/20

2016

2017

2018

2019

2020

Call

TAC
6/2018

GO Cy1
deadline
3/2018

GO Cy2
deadline
12/2019

TAC
2/2020

launch
2018Oct

JWST

Option 1: Consolidated TAC

Advantages:

- Logistics & recruitment – only dealing with one event → easier for STScI
- Opportunities for reviewers to consider HST/JWST synergies directly
- “JWST Cycle 1” will make it easier to recruit panelists

Challenges:

- Workload - anticipate up to 2000 proposals
 - Concentrated effort pre-TAC by user support
 - More reviewers, more panels (20+), fewer orbit/hours per panel
- Logistical complications
 - Hosting & supporting additional panels
 - Mixing HST & JWST proposal assignments to panels/reviewers, given separate deadlines
- Proposal preparation – proposal deadlines remain closely spaced and will tax community resources

Adjustments:

- Removing smaller HST proposals (<15 orbits?, regular AR) from the panel discussions would reduce the workload by ~400 proposals

Option 2: Early Cy 26 TAC

- Offset the HST and JWST time allocation processes
 - Move the HST Cycle 26 process earlier in the year
 - CP in September/October 2017
 - Deadline in January 2018
 - TAC in March 2018
 - Phase II in May 2018
 - Cycle 25 duration could be left unchanged (A) or shortened (B)
 - FRC schedule unchanged
 - Revert to nominal schedule for Cycle 27 to avoid collision with JWST Cycle 2
 - Minor adjustments to the JWST TAC schedule
 - Deadline in March 2018
 - TAC in June 2018

Early HST Cycle 26 TAC: 2A

HST

Cy25
deadline
4/2017

Cy26
deadline
1/2018

Cy27
deadline
4/2019

Cy28
deadline
4/2020

TAC
6/17

TAC
3/18

TAC
6/19

TAC
6/20

2016

2017

2018

2019

2020

↑
Call
11/2017

↑
TAC
6/2018

GO Cy1
deadline
3/2018

↑
GO Cy2
deadline
12/2019

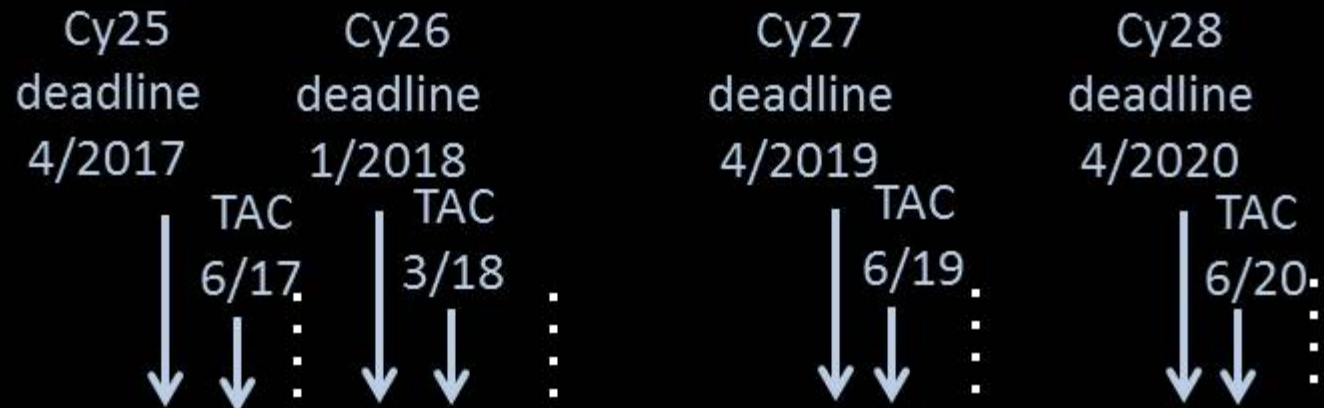
↑
TAC
2/2020

launch
2018Oct

JWST

Early HST Cycle 26 TAC: 2B

HST



2016

2017

2018

2019

2020

TAC
6/2018

GO Cy1
deadline
3/2018

GO Cy2
deadline
12/2019

TAC
2/2020

JWST

launch
2018Oct

Option 2: Early Cy 26 TAC

Advantages:

- Separates HST and JWST proposal timelines from an STScI perspective
 - Not so good for the community

Challenges:

- TAC Recruitment
 - Competition with other activities in January-March (but note we're planning on this schedule for JWST Cycle 2)
 - Proposal review overlaps with the JWST proposal submission schedule (potential for additional conflicts of interest)
- Scheduling (?)
 - If Cy 25 is shortened to < 12 months
- Topicality
 - If Cy 25/26 boundary maintained, deadline is ~10 months before the cycle starts
- Documentation (?)
 - Need to turn around the CP in 9 months

Adjustments:

- Allocate more orbits to mid-cycle HST proposals to enable follow-up of new discoveries

Option 3: Late Cy 26 TAC

- Offset the HST and JWST time allocation processes
 - Move the HST Cycle 26 process later in the year
 - Extend Cycle 25 to 16 months
 - Cycle 26 starts in ~February 2019
 - CP in April 2018
 - Deadline in July 2018
 - TAC in late-August/September 2018
 - External reviewers for “small” programs (<15 orbits, ~500 proposals)
 - On-site panel review for other programs
 - Phase II in October 2018
 - LRP constructed 10/2018 through 1/2019
 - Cy 26 FRC meeting in Jan/Feb 2019
 - Maintain schedule in future cycles
 - Minor adjustments to some aspects of the JWST process

Late Cy 26 TAC: 3

HST

Cy25
deadline
4/2017

TAC
6/17

Cy26
deadline
7/2018

TAC
9/18

Cy27
deadline
7/2019

TAC
9/19

Cy28
deadline
7/2020

TAC
9/20

2016

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2018

2019

2020

↑
Call
11/2017

↑
TAC
5/2018

↑
GO Cy1
deadline
2/2018

↑
GO Cy2
deadline
12/2019

↑
TAC
2/2020

launch
2018Oct

JWST

Option 3: Late Cy 26 TAC

Advantages:

- Creates separation between HST and JWST timelines
- Opportunities for additional large-scale programs in Cycle 25
- 20-25% reduction in on-site proposal reviews → smaller TAC
- Opportunity for HST proposals to supplement approved JWST programs

Challenges:

- TAC Recruitment
 - Competition with other activities in August/September?
- Scheduling (?)
 - Complications with a 16 month schedule with visibilities?
 - LRP calculation interferes directly with JWST computations in 2020 & succeeding years
- Turnaround time
 - Need to allow for end of year holidays in developing LRP → >6 months from proposal deadline to start of the cycle
- Grant funding
 - Need to deal with cycle that extends over 2 fy

Adjustments:

- Allocate more orbits to mid-cycle proposals to enable follow-up of new discoveries

