JWST Grants Review Working Group

Membership:

→ Rupali Chandar (U Toledo)
→ Phil Choi (Pomona College)
→ Tuan Do (UCLA)
→ Rose Finn (Siena College)
→ Jamie Kennea (Penn State)
→ Dale Kocevski (Colby College)
→ Lauranne Lanz (College of NJ)
→ Danny Milisavljevic (Purdue)
→ Rodolfo Montez (Chandra)
→ Casey Papovich (TAMU)
→ Ata Sarajedini (FAU, Chair)

Prime Directives for the Working Group:

→ Optimize the funding to maximize the scientific return of each program.

→ Minimize the overall effort required to prepare, evaluate, and revise budgets.

→ Ensure that the process is equitable across the demographics of proposal categories and proposers.

During our weekly meetings starting in January and culminating in June, we discussed various factors related to the current FRC model, a purely formulaic model and one that is a hybrid of both.

After a great deal of discussion, a member of the WG, Dale Kocevski, presented the results of his investigation of a purely formulaic approach.

Investigating a Formulaic Approach

Machine learning based model trained on the Cycle 2 and Cycle 3 GO data to estimate what percentage of the funding manifold can be accounted for with various fitting parameters.

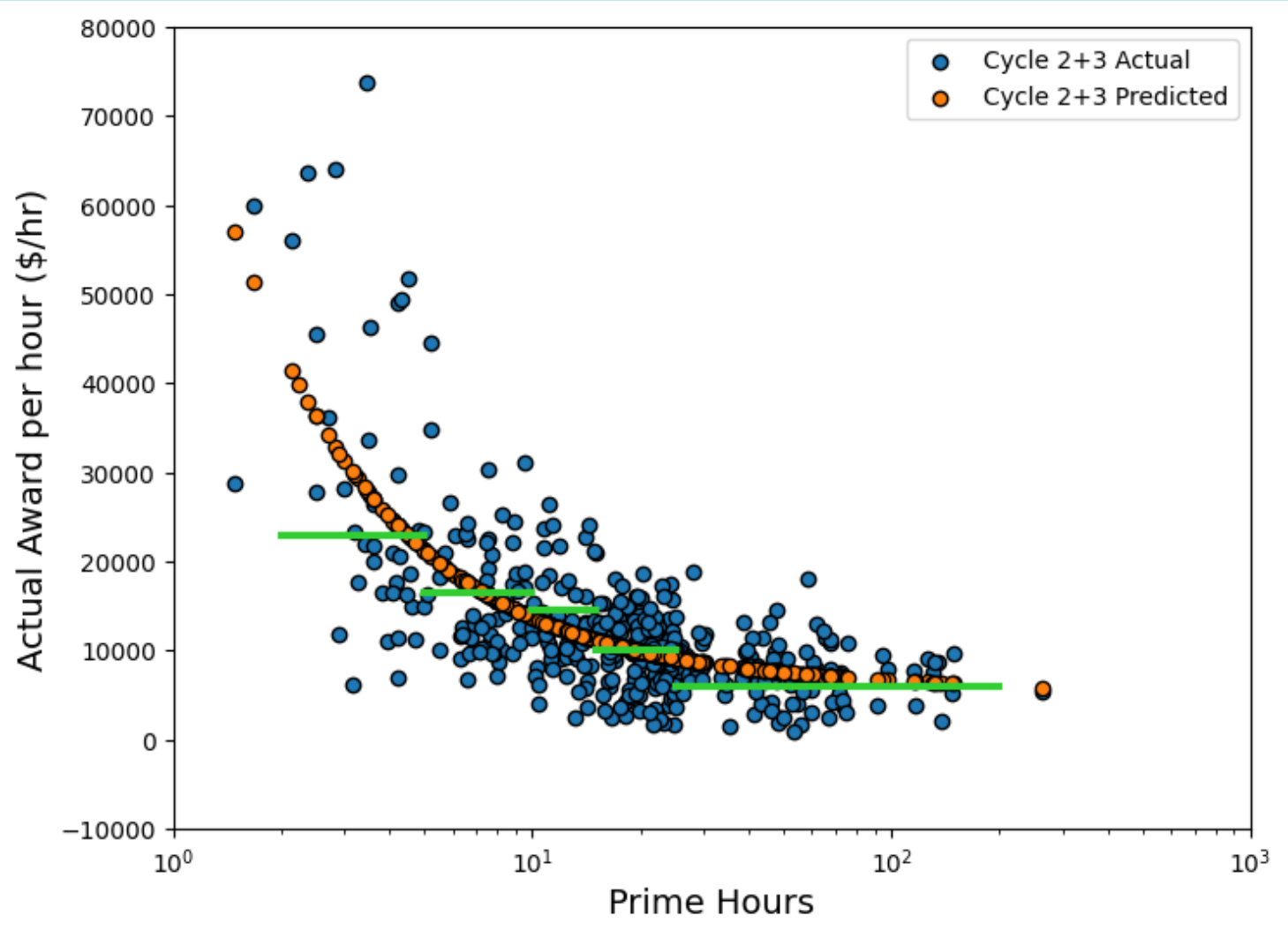
These are the most important fitting parameters in ranked order:

1. Prime instrument observing hours (64% of variation)
2. US Principal Investigator (13% of variation)
3. Primary observing instrument (9% of variation)

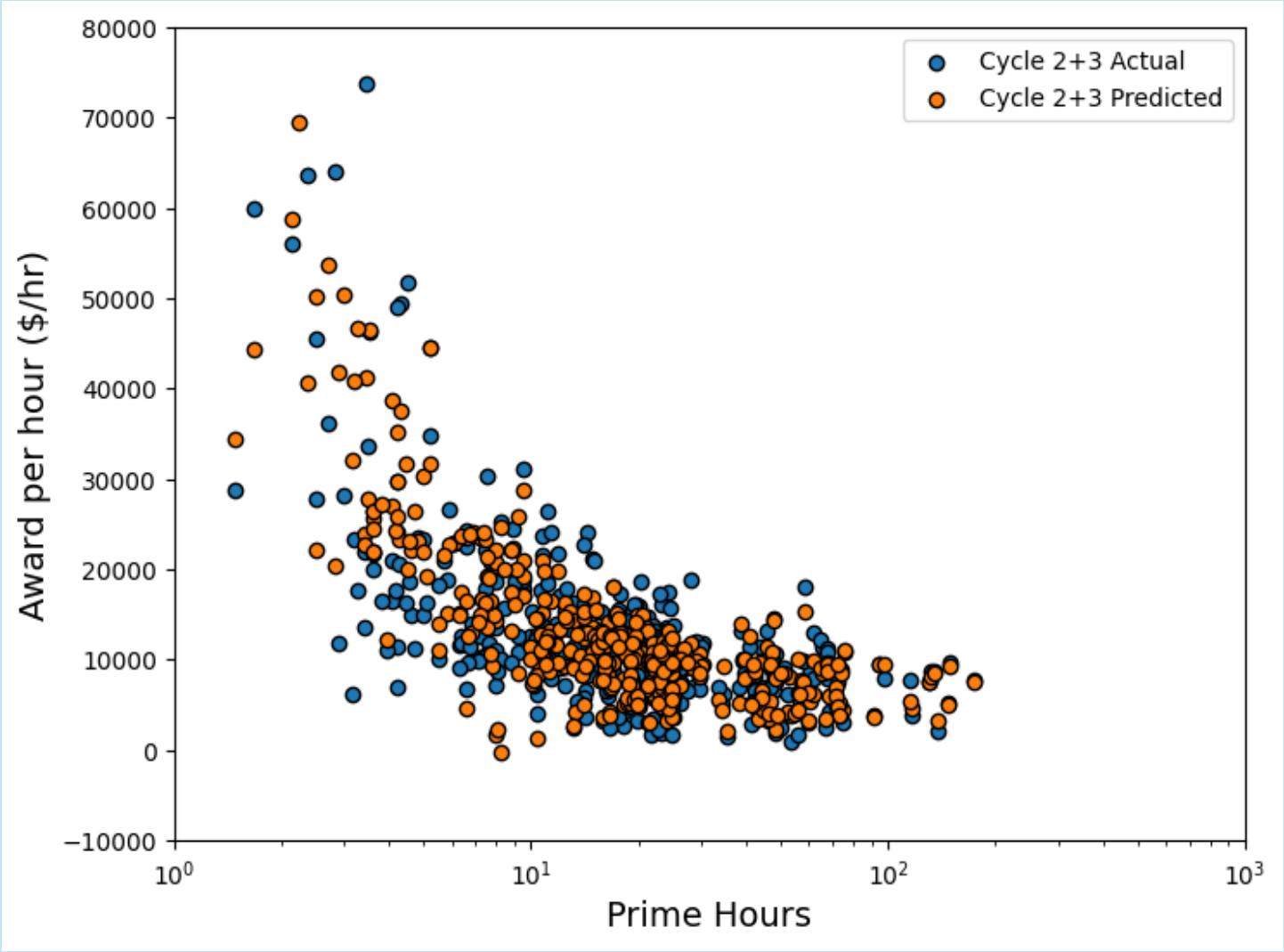
For reference, the JWST Cycle 3 FRC advocated for a simple formula - looking at Cycle 3 results, the average $/hour is

→ $23K for <5 hours
→ $16.5K for 5 to 9.9 hours
→ $14.5K for 10 to 14.9 hours
→ $10K for 15 to 24.9 hours.

→ We will refer to these as the “JWST reference allocations.”



Actual awards $/hour as a function of the prime instrument observing hours for Cycle 2 and 3 (blue points). The orange points represent the polynomial fit for a model that only includes the allocated hours per program. The green horizontal lines are the "JWST reference allocations" from the Cycle 3 FRC.



In addition to modeling using the prime instrument observing hours, if we add the PI status (US or non-US), the scatter is reduced by 12% over the JWST reference allocations. Adding information on the instrument used reduces the scatter by an additional 17%.

Other factors that were deemed important in a formulaic approach:

→ Total amount of funding available for cycle from NASA

→ Floor level of funding (minimum needed to do the proposed science)

→ Complexity of the analysis
- Instrument(s) + mode(s) of the proposed observations
- Judged by the investigators
- Judged by the TAC
- Given by the investigators and then evaluated by the TAC

→ Ratio Number of total investigators / US investigators

→ non-US Principal Investigator

Recommendation:

→ Implementing a hybrid approach: formula + appeals

→ Details of the formula should be kept internal and should be allowed to evolve from cycle-to-cycle.

→ The primary factors upon which the formula should be based and its implementation are outlined in #4 and #5 of the final report.

→ The possible evolution of this funding approach from cycle to cycle should be assessed by this Working Group or another one convened by STScI as more data are gathered to refine the process.

Specific Example of a Hybrid Approach

→ Derive a first-order formula based on General Observer programs to model the total dollar allocation for each program.

→ For very small programs, for example those allocated say 1 hour, apply a minimum funding allocation to those programs - exact dollar amount TBD.

→ Provide a target maximum dollar allocation to each proposer and ask them to submit a budget requesting and justifying the dollar amount as given by the formula.

→ Any proposing group that submits a budget asking for more than this formulaic amount (say by 1% or 2%), will then have their budget proposal evaluated by the FRC.

→ The FRC will automatically evaluate the large programs requesting more than say $400K.

→ The FRC could also be asked to evaluate programs with an overwhelming majority of non-US investigators.

→ The FRC will also evaluate budgets submitted for Archival and Theory programs.

Thank you for your time.

Questions?

Charge:

- Identify the key principles that should underlie JWST grant funding allocations for the US community
- Codify the advantages and disadvantages of an FRC-style review and of a formulaic budget-allocation process
- Identify the impacts to equity of the current process, and of a formulaic approach, across community demographics, including career stage, type of institution, and DEIA categories
- Determine what factors could be included within a formulaic approach, including the possibility of appealing a budget decision allocation
- Develop specific examples of formulae
- Identify improvements that could be made to the current FRC process, if the committee recommends keeping it
- Provide a consensus recommendation on the preferred grant-allocation process