From: J.D. Smith, on behalf of the JWST Users Committee (JSTUC)

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The JSTUC is pleased to provide the following updates and formal recommendations from its September, 2023 meeting.

1. Summary

Meeting #15 of the JSTUC was held immediately after the successful "*First Year of JWST Science*" conference. The remarkable early science returns highlighted during this conference are due in no small part to outstanding contributions from dedicated people at Space Telescope, Goddard, the instrument teams, NASA headquarters, and at all our international and industrial partners. On behalf of this committee and the entire JWST users community, I want to convey our deep gratitude.

Over a productive two day meeting we had in-depth discussions covering a wide range of topics, including instrument and spacecraft performance; proposal selection; time allocation and scheduling; pipeline and calibration challenges and progress; communication with the JWST community; exclusive access periods; the grants process; the deep space network, and more. Below, we outline specific recommendations in these categories.

2. Pipeline and Calibration

> A simple goal for the pipeline was put forward by the JWST Project Scientist, which the JSTUC wholeheartedly endorses: **"A typical graduate student should be able to produce calibrated, science-ready data products from the pipeline within about two weeks of downloading it, for all 17 of JWST's modes."**

JWST offers a wide range of observing modes, which means its calibration and reduction pipelines have major footprints. While the boxed criterion above is not yet met across the board, continuous progress has been made. We applaud STScI for seeking feedback via its user survey, and for taking seriously the community's expressed concerns regarding the state of JWST's pipelines. It is clear to the committee that the scope and number of important, known improvements to the pipeline and related tooling exceeds the available resources, and that pipeline expertise remains rare in the broader community. We have three specific recommendations.

2.1. Prioritization

A simple, high-level development *prioritization methodology* for the pipeline and associated tools should be adopted and shared with the JSTUC prior to our next meeting, factoring in i)

utilization frequency of the 17 instrument modes among awarded programs, and ii) specific user satisfaction metrics in the form of helpdesk tickets, by-instrument and by-mode survey results, and other relevant data. The resulting "heat map" will serve as a valuable guide to gauge progress and direct pipeline development where it will have the most impact.

2.2. External Expertise

Significant expertise with JWST data and its processing and analysis is accumulating *outside* of STScI in research groups around the world. The open paradigm adopted for JWST pipeline and adjacent package development represents an important strength, enabling a rich ecosystem of external tools. We recommend lowering the barrier to entry for motivated members of the community to contribute tools, analysis techniques, calibration data or approaches, direct pipeline improvements, and more. The [Tools from the Community](#) page and upcoming [Improving Data Products Workshop](#) are good steps in this direction. We recommend developing additional incentives for external user contributions, including recognition in newsletters, co-publication with STScI scientists where appropriate, funded hands-on workshop support, and direct pipeline/data analysis tool development grants.

2.3. JWST Ambassadors

The quickest and best way to get help with JWST data is often by consulting a *local expert*, but pipeline expertise remains relatively rare within the broader community. We recommend developing and regionally hosting a pipeline training program along the lines of ESA's planned *Data Masterclass*, the *ALMA Ambassadors* program, and JWST's own pre-launch regional proposal expert training sessions.

3. Exclusive Access Period

There is a shift underway in the broader US scientific community emphasizing rapid access to data from public facilities. The JSTUC sees the clear value of moving towards this goal. Yet, as in many other NASA research areas, data as it arrives straight from JWST's automated pipeline cannot be considered fully reduced and calibrated. Results from the recent survey on Exclusive Access reflect this: many in the community see substantial harms from reducing or eliminating a suitable calibration and data improvement period, harm which falls particularly to students and researchers with other fixed commitments such as academic year teaching. A mature pipeline is also clearly an important milestone on the path to a reduced calibration period. We therefore recommend making any changes to the current exclusive period defaults slowly and deliberately, focusing first on the largest programs, which benefit the most from observing time and funding allocation.

4. Communication with the Community

Communication is vital for maintaining the health of JWST's scientific community. We are thankful for recent clear and timely communications, for example on the MIRI count rate decline, as well as the newly debuted [Known Issues Page](#). Two additional areas where clearer communication would be helpful to the community were identified:

1. information about scheduling and typical completion percentages for pure parallel programs, and

2. the 15 hour Small proposal threshold below which external non-panel review is conducted.

We note and appreciate recent updates to the [What's New](#) page on both of these topics. For <15hr proposal review, we suggest keeping the community well-apprised of this distinction and any changes to the policy in future cycles.

It was notable that by far the most positive feedback received from the user surveys was for any channel of direct contact with STSCI staff. We recommend expanding support for staff in their roles as community liaisons, including at face-to-face meetings, hands-on workshops, and other community events.

5. Deep Space Network

The DSN represents critical supporting infrastructure fundamental to JWST's data-rich science landscape. While recent impacts from DSN contention on JWST downlink have been rare, there have been a number of close calls, and the potential remains for insufficient downlink access to force JWST to idle for hours or days. We encourage STScI to work with NASA to prioritize JWST downlink, and work towards expanding capabilities through new development and partnerships. Accommodating increased data rates is a relatively low cost way to multiply JWST's science potential.

6. Proposal Selection and Funding

The substantial efforts STScI invests in JWST time allocation are clear, and the TAC process is widely respected in the community. While budgeting for awarded grants in Cycle 1 was a challenging process for many, this was improved with workshops and greater transparency in Cycle 2. Looking ahead, we see several opportunities to streamline the process and improve JWST's scientific yield and efficiency.

6.1. Very Large Programs

We endorse offering Very Large Programs (above 300 hours) with zero exclusive period in Cycle 4 with a specific advertised *minimum* time allocation, which activates above a fixed proposal pressure threshold in that category.

6.2. Formula-based Grants Process

We endorse the study and eventual implementation of a *budget formula* designed to cover the research program needs of the majority of successful US proposers. We recommend the creation of a *Budget Formulation Committee*, involving recent members of the JWST *Financial Review Committee (FRC)*, with broad representation across research area, career stage, and type of institution. While we defer to this committee for final recommendations, we suggest a *hybrid* approach, involving use of the formula for most but not all award categories, plus the option to request FRC review, will be a reasonable posture early after implementation.

6.3. Panel Categories

JWST science is distinct from the HST science which originally motivated its selection panel categories. With two and soon to be three proposal cycles under our belt, it is important to revisit

these categories with community input. We recommend the formation of a committee including community members across subfields to update and modernize selection panel scientific categories for JWST, targeting a fair and even proposal distribution.

6.4. Target Conflicts after the TAC

The JSTUC was concerned about the number of awarded program target conflicts which were not resolved during the Cycle 2 TAC. The TAC and its anonymous, science-driven review is the appropriate place for resolving such conflicts. We recommend putting in place strong preventative technical measures to alert the TAC of target conflicts so they can be resolved during the review, to reduce the likelihood of this occurring in future cycles.

In addition, when awarded programs are being considered for cancellation due to target repeats or other concerns, if one or more of the proposals under review has apparent conflicts of interest, for example by involving STScI personnel at a high level, an external review committee with membership from the relevant TAC should be employed to make the final recommendation.

7. Conclusion

We look forward to working with NASA and STScI to continuously improve on JWST's scientific output, public impact, and community engagement.

Sincerely,

J.D. Smith, on behalf of the JSTUC