



Cerro Tololo Inter-American Observatory  
Community Science and Data Center  
Gemini Observatory  
Kitt Peak National Observatory  
Vera C. Rubin Observatory

April 7, 2020

Dr. Ken Sembach, Director  
Space Telescope Science Institute  
3700 San Martin Drive  
Baltimore, MD 21218

Dear Ken,

The WSTAC thanks you, Neill Reid, Karen Clendenin, and all of the speakers for an engaging kick-off meeting, February 12-13 2020. We left the meeting with renewed excitement for WFIRST's potential as a Great Observatory, for which every  $0.281 \text{ deg}^2$  pointing will deliver a present-day survey's worth of data and opportunity. Applying that definition of *survey*, WFIRST will deliver an enormous range of survey scales - from small-scale, guest-proposed surveys to the massive core surveys that have formed the foundation of WFIRST's Design Reference Mission and that are responsive to Decadal recommendations.

In consideration of the core surveys' zero proprietary time and data product availability to all astronomers, we described these as Core Community Surveys (and/or Flagship Surveys) during our discussions. Given the enormity of science that WFIRST's Core Community Surveys will enable, we avoided using the narrow nomenclature High Latitude, Supernova, and Microlensing Surveys during our discussions. Perhaps input from the SITs could be solicited to select more appealing and inclusive names.

In addition to desiring more inclusive nomenclature, we have four recommendations aimed to strengthen WFIRST's potential to deliver as a Great Observatory to a diverse astronomy community:

**Include broad community input in defining WFIRST's observing program**

We recognize the ongoing foundational value that WFIRST's Science Investigation Teams (SITs) have had in formulating the WFIRST Design Reference Mission and requirements. We agree that it is critically important to build on and retain this expertise, and we look forward to hearing plans for this in an upcoming meeting. As WFIRST progresses from formulation to implementation, broad community input is also becoming increasingly vital:

- Planning for WFIRST ultra-deep field(s) appears to be a time-sensitive priority, to allow for the planning and implementation of coordinated observations from both



the ground and space. We recommend that the planning for ultra-deep fields begins this year, and that the community be invited to participate in the selection of ultra-deep field pointing(s).

- We recommend that the community be invited to contribute to future priority setting (e.g., early science) and to an ongoing evaluation of WFIRST's implementation strategy. For example, the overall observing program should be re-optimized at some point with input from the broad science community, while maintaining fidelity with the Decadal vision.

The WSTAC will discuss these topics again in the future, with the Vera C. Rubin Observatory providing one recent example of community engagement in the early selection of deep field pointings and in studying an experiment's overall observing program.

### **Strengthen community engagement**

We recognize the ~30 WFIRST-relevant white papers submitted to Astro2020, roughly half of which were not related to a SIT. Nevertheless, we also recognize that WFIRST does not yet have broad, vocal community support and identify several opportunities to begin strengthening this engagement. We understand that STScI faces external constraints within its current statement of work, that may limit your ability to implement these recommendations:

- Consistently use more community-inclusive language to describe WFIRST and its core surveys.
- Continue to advertise that WFIRST is a tool for the entire astronomy community that will be planned with broad community input, including ensuring that the community will be provided the data products necessary to conduct their science (see below).
- Begin reaching out beyond the SITs (see recommendations above and below) for input on WFIRST planning.
- Work with the WFIRST Project to re-prioritize WFIRST activities at STScI and revisit community-unfriendly aspects of the ground system that we heard about at this meeting: the software under development to plan observations will only be usable by "experts", the proposed limit of 30 small ("GO") surveys, the proposed two weeks lower limit on small survey size, and the proposed policy to approve small surveys that might not get scheduled.



### **Strengthen the vision and definition of WFIRST's data management system**

The WSTAC had substantial concerns about the limited level of resources currently being invested into the development of WFIRST's data management (DM) system. We were also concerned about the siloed development of the DM system, and a lack of clarity on how its requirements are being set. Given the large volume and rapid availability of WFIRST's imaging dataset, and the time-sensitivity of the core time domain surveys, WFIRST's ultimate scientific productivity will rely critically on its software, science platform, data archive, and science catalog deliverables. We recommend:

- Work with the WFIRST Project to increase focus and support of data management approaches similar to those originally proposed by STScI.
- Survey the astronomy community to ask for input on the observing strategy and catalog data products that will be necessary to conduct their science with WFIRST data. This community survey could also communicate that the WFIRST survey plans and implementation are not finalized. We suggest that this survey could be distributed through a combination of more personalized connections with individuals (e.g. WFIRST white paper authors, SIT leads) and broad canvassing (e.g., via existing email exploders).
- Work with the WFIRST Project to increase alignment between science deliverable responsibility and authority over resources.
- Stand up an external review of the scope and resources currently planned for WFIRST's data management system.

We also discussed the current vision for WFIRST's data management deliverables as it includes substantial responsibility in the hands of experts in the community. By the next WSTAC meeting, we would like to hear a concrete plan for this community role in delivering software, including a plan for the review of, quality control for, and accountability for those deliverables.

### **Reduce communication silos**

Finally, during the presentations and discussions, we noticed some inconsistent use of terminology and gaps in communication among institutions contributing to the development of WFIRST's ground system. Community engagement and trust will depend heavily on hearing consistent, community-friendly narratives from all ground-system centers. We therefore recommend STScI invests effort to resolve some of these communication silos, for example:



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- Make nomenclature choices agreed upon and embedded in all communication, in particular the words used to refer to WFIRST's core surveys and the way community input opportunities are described.
- Strengthen cross-center collaboration on WFIRST's data management system. For example, IPAC-related microlensing pipeline development for light curves could benefit all time domain science.

We recognize that WFIRST has evolved considerably since the 2010 Decadal Survey, and that its larger aperture enables considerably more science than envisaged at that time. The WSTAC hopes that these recommendations are helpful to you and your staff as you continue preparing for WFIRST's science operations.

Sincerely, and on behalf of the committee,

A handwritten signature in black ink, appearing to read "Beth Willman".

Beth Willman  
Chair, WFIRST Science and Technology Advisory Committee  
Deputy Director, NSF's OIR Lab

WSTAC Committee Members:

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