

TESTIMONY TO THE COMMITTEE

ON

SCIENCE, SPACE AND TECHNOLOGY

SUBCOMMITTEE ON SPACE

DECEMBER 6, 2017

A. THOMAS YOUNG

Chairman Babin, Ranking Member Bera and Committee members, I am pleased to present my views on the management of large space telescope projects.

Space telescopes are a valuable and mandatory asset in the scientific exploration of our solar system, our galaxy and the universe. Space telescopes range in size from Explorers to large flagship missions. The 2010 Decadal Survey emphasized the importance of maintaining a balance in the mix of Explorers and large missions. Flagship missions such as Hubble, James Webb Space Telescope (JWST) and WFIRST are mandatory to pursue scientific priorities that can only be investigated with large systems. NASA's Explorer Program has a rich history of scientific discovery and provides critical opportunities to develop scientists and engineers for the future. The excellence of the U. S. Astronomy and Astrophysics Program cannot be maintained without a healthy balance of large, medium and small missions.

I shall concentrate my comments upon JWST and WFIRST. These two flagship missions are in very different phases of their

development with very different current challenges. Each mission requires bold leadership to assure mission success.

JWST was the highest ranked mission in the 2001 Decadal Survey. Clearly, JWST is one of the most important and challenging civil space missions ever undertaken. JWST has a history of cost growth and schedule delays. It also has had a history of development success on a project with significant technological challenges. NASA made a decision a few years ago to "fix" JWST programmatic issues by budgeting to the most probable cost and scheduling to the most probable schedule. Until recently, performance to this revised plan has been quite good. The current assessment of JWST's status is that integration and test will take significantly longer than planned. The result is a launch schedule delay and the consumption of most of the remaining funding reserves. In my opinion, the launch date and required funding cannot be determined until a new plan is thoughtfully developed and verified by independent review.

The bold leadership I spoke of earlier is required to assure that risk is not added to the program while trying to minimize the schedule and cost impacts. JWST is at the point in its development where the only criterion that is important is mission success. Every appropriate thing that can be done to maximize the probability of success should be done. At this

stage of the project, a few extra days or weeks or even months of schedule delay or the expenditure of some additional dollars is a small price to pay to assure success of a mission as important as JWST.

Turning to WFIRST, it was the top priority mission in the 2010 Decadal Survey. It was defined as a significant scientific mission with medium cost and risk. However, WFIRST has had requirements creep to the degree that "medium cost and risk" no longer applies. Each of the added requirements has contributed to the scientific value of the mission, but at a cost. That cost is additional risk, cost and a potential erosion of program balance that was so strongly emphasized in the 2010 Decadal Survey.

The bold leadership I spoke of earlier is required to assure that the most comprehensive and scientifically valuable Astronomy and Astrophysics Program --- including WFIRST --- is implemented. As the Decadal Survey's highest priority, WFIRST must be successfully completed. The good news is that WFIRST has not yet reached Milestone B. All requirements are currently controllable. NASA is to be congratulated for taking an important step with the establishment of the WFIRST Independent External Technical/Management/Cost Review (WIETR). WIETR has effectively defined the scope, cost and risk issues for WFIRST. The next step is to decide the scope, cost

and risk appropriate for a top priority flagship mission that is consistent with a balanced Astronomy and Astrophysics Program. I want to emphasize that there is no cause for panic. What is transpiring is a perfectly healthy process to assure that the scope, cost and risk are appropriately defined prior to proceeding past Milestone B.

Many studies have shown that the two most significant causes of cost growth and schedule erosion are failure to budget to the most probable cost and failure to control requirements. The history of JWST has been plagued with the failure to budget to the most probable cost. This failure has been true for many space programs. NASA has largely corrected this problem by implementing a policy that requires statistical and independent cost estimating and budgeting to the most probable cost estimate which NASA has defined as 70/30.

WFIRST has been plagued with continual requirements creep. The implementation of a comprehensive, independent requirements review prior to Milestone B followed by a rigorous decision process will mitigate this issue. The process being implemented for WFIRST should become standard for all major NASA projects.

I believe NASA has the ability to manage large space telescope projects. Implementing statistical and independent

cost estimating followed by budgeting to the most probable cost is a major improvement. Prior to Milestone B, conducting an independent, external review of requirements, cost and risk that is followed by a decision process that assures the mission is consistent with the Decadal Survey including a balanced scientific program is equally important. Following Milestone B, requirements must be rigorously managed to prevent requirements creep.

Thank you, I will be pleased to respond to any questions you may have.