

March 16, 2022

**Re: March 3<sup>rd</sup>, 2022 RSTAC Meeting**

Dear Ken,

The RSTAC thanks you and your team for the virtual RSTAC meeting held March 3, 2022. During the meeting, we were briefed by Julie McEnery (Roman Space Telescope Project Scientist) on overall updates from the Nancy Grace Roman Space Telescope project, the Non-Advocate Review process, and the increased efforts for Roman-Rubin-Euclid coordination. We were briefed by Suvi Gezari (STScI Science Lead for Time Domain and Multi-Messenger Astronomy) on the process behind the AURA Roman-Rubin Synergy Working Group's report on "R2-D2: Roman and Rubin -- from Data to Discovery" and an overview of its findings. We were also updated by Roeland van der Marel (STScI Roman Space Telescope Mission Office Head) on the current plans for community engagement in developing the Core Community Surveys for Roman.

We congratulate the Project, once again, for meeting the observatory build targets and for continuing to make significant progress, despite ongoing challenges due to the pandemic. It is exciting to see the observatory continue to become ever more of a reality!

We focused our discussion on four main areas, namely (i) the distribution of Roman observing time (ii) the community engagement in the Core Community Surveys (CCS), (iii) the synergy between the Roman and Rubin observatories, and (iv) possible funding models to support the science from Roman data.

**Distribution of Observing Time:**

- The Roman baseline plans envisage a 75/25 split in observing time between the CCS and the General Astrophysics Surveys (GAS) selected via open calls for proposals and a peer-selected process. The RSTAC discussed this balance and noted that a heavy emphasis of time dedicated to CCSs capitalizes on the unique survey aspect of Roman that might not be fully realized if the CCS were downscoped. The RSTAC also reiterated that having GAS and open calls for proposals are important not only to realize the science potential of Roman but also in building additional community support for the observatory, and, thus, did not recommend the CCS time be upscoped. The RSTAC also noted that a re-adjustment in the 75/25 split would require significant analysis of difficult to quantify trade-offs over a large parameter space with potential delays to defining the CCS. The RSTAC felt that instead of re-evaluating the 75/25 split, the effort should continue to be directed toward increasing the role of community voices in helping to optimize the CCS to achieve a broad range of science goals, as well as to defining a proposal process for

the GAS that maximizes opportunities for creative science programs from all corners of the astronomical community.

- The current SOC plans for the GAS is to allow up to 30 programs awarded over a 5 year timeline, which translates to ~2 weeks of Roman observing time per program (i.e., only large projects). As the RSTAC noted previously, this is in tension with what the community perceives its needs to be (as expressed in the SOC's Spring 2020 community survey) and might stifle innovative and important science programs that could be achieved with much less than two weeks of observing time, thanks to Roman's remarkable field of view. Offering only large programs also has the potential to limit access to Roman by early career researchers and researchers at smaller institutions for whom designing and executing large programs may pose unique challenges. The RSTAC encourages the SOC to expand the distribution of GAS programs across small, medium, and large categories. The RSTAC also recognizes that doing so will increase operational costs and suggests that the distribution between these different categories should, in part, be guided by a cost-analysis. Finally, the RSTAC discussed the benefits of having the community "self-organize" for large program submissions. In this framework, instead of having competing proposals for a single topic, ambitious science efforts could be achieved by community member coordination within a specific focus, following the example being set in exploring a possible Roman deep-field as part of the GAS time.

#### **Community Engagement in Defining the Core Community Surveys:**

- The RSTAC recognized and celebrated the significant progress that continues to be made toward engaging the astronomical community in optimizing the design of the CCS. Early community input is crucial to ensure that the three core surveys (High Latitude Wide Area, High Latitude Time Domain Survey, and Galactic Bulge Time Domain) will enable a broad range of archival science investigations across many fields, while also meeting the mission's cosmology and exoplanet demographics objectives. The plan outlined during the discussion was to engage with the community in a variety of venues and solicit community input in a variety of formats, to thoughtfully construct committees that incorporate diverse areas of expertise relevant to each core survey and to task these committees with synthesizing their inputs into actionable survey designs. The RSTAC consensus was that this is the right direction to be going in, and we particularly valued that attention is continuing to be paid toward ensuring this is an inclusive process where many kinds of voices can be heard, including broad outreach to multiple communities, participation from early career scientists, and researchers at primarily undergraduate institutions and minority serving institutions.
- The RSTAC agreed with the SOC that success of this process will depend strongly on the expertise and fairness of the members of the survey design committees and that these positions will demand significant work effort leading up to and after launch. The selection of these committee members and how their efforts can be sustained with

necessary funding are two critical areas that should be looked at particularly closely as this process ramps up.

- The nominal timeline for the CCS community engagement process starts soon (in 2022), to allow ample time for workshops, white papers, and iteration with multiple communities with time to finalize survey optimizations before launch. The RSTAC agrees that genuine community engagement cannot be rushed, so it is important to start as soon as possible.

#### **Synergies between the Roman and Rubin Projects:**

- The RSTAC was impressed with the significant strides that have been made in bringing the Roman and Rubin communities together to talk and collaborate. The “R2-D2: Roman and Rubin -- from Data to Discovery” report is an excellent demonstration of cross-project collaboration, can serve as a collection of concrete science cases to seed both CCS design and example GAS programs, and provides a valuable outline of the mapping between implementation requirements for Roman and science synergies between the two projects. The RSTAC hopes that similar rapid progress will continue to be made on all sides of the Roman-Rubin-Euclid coordination effort.
- The R2-D2 report highlighted science projects on a range of scales, from ambitious wide-angle surveys coordinated between the two projects down to smaller programs following up individual objects. The RSTAC was most impressed with the discussions of survey coordination on larger scales, where sustained conversation between two projects may allow Roman’s core surveys to benefit from much of the long-term community engagement that has already gone into the design of Rubin’s observational design, and in the emphasis on shared infrastructure to enable science data discovery across both projects. Furthermore, beyond specific science cases, it seems likely that expertise that has gone into the overall design process and strategies for community-driven survey optimization for Rubin may serve as valuable resources for Roman’s own community-driven design process for the CCS.

#### **Funding to Support Roman Science:**

- The RSTAC briefly discussed the unique challenges in funding projects using Roman data, compared with previous space missions. For example, in the current funding model for Hubble and JWST, there is a direct mapping between a proposing team and the data. For Roman, a significant number of funding requests are expected for projects utilizing the CCS data that are not easily tied to “number of orbits, hours, or pointings”. Given the complexity and importance of the issue, the RSTAC felt this topic warranted a more thorough discussion than the time allowed and would welcome an opportunity to discuss this at a future RSTAC meeting.

The RSTAC hopes that this input is helpful to you and your team as you continue preparing for Roman's science operations.

Sincerely,



Kristen McQuinn, Rutgers University  
Acting Co-Chair for March 3, 2022 meeting



Zachory Berta-Thompson, University of Colorado  
Acting Co-Chair for March 3, 2022 meeting

On behalf of RSTAC members:

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