

SAG 22 – Interim Report

March 26, 2021

Current and upcoming NASA missions will be intensively observing a number of stellar systems to characterize exoplanets. The selection of those target systems and the interpretation of the observations depends on knowing the properties of the host stars to various levels of precision. There is therefore a need for a comprehensive catalog of star and planetary system properties of possible targets for future exoplanet missions. Compared to existing catalogs and resources, this work is focused on a much smaller set of target stars, and a much larger set of system properties.

The goal of this SAG is to identify a set of stellar properties to be included in the catalog, review the number and types of stars to be included, and consider the attributes of a living catalog that can be maintained, improved, and curated. During the “information gathering” phase, the SAG was broken up into four unique “task forces”:

- Task Force 1: Systematically gathered information about science drivers and data products for currently active and future exoplanet-related missions.
- Task Force 2: Created a master target list that considered a variety of exoplanet missions: RV, direct imaging, and transiting surveys. The target list was cross matched based on 2MASS and includes other basic parameters such as RA, Dec, Parallax, V-mag, G-mag, J-mag, K-mag, and spectral type.
- Task Force 3: Defined and categorized the different interdisciplinary science use cases for which a future target star archive for exoplanet science could be expected to serve. Responses from dozens of scientists were categorized, processed, and correlated to find common themes among the different disciplinary use cases.
- Task Force 4: Provided a list of existing, refereed, and publicly available catalogs of stellar properties, with a breakdown of the catalog contents, including estimates of the range of values of each parameter and typical precision. It was also noted which catalogs are publicly available through open online interfaces and how often they are updated.

In addition to the information gathered from the task forces, SAG22 has invited representatives of a broad range of future exoplanet-related missions to speak at SAG meetings. The SAG has given these missions the opportunity for direct input and feedback.

SAG22 is currently wrapping up the information gathering phase and transitioning to the synthesis phase. During the synthesis phase, and in anticipation of the final report, SAG22 will provide motivation for the utility of a potential archive. That will include science cases and mission planning needs, a list of the current highest priority targets, the anticipated science that can be done for planned mission observables (in addition to the data that has already been collected on these targets), and a technical breakdown of the front-end and back-end of an archive that would be most useful to the exoplanet community.