



2018 July 23

To: Chas Beichman  
Executive Director, NASA Exoplanet Science Institute  
at the California Institute of Technology and Jet Propulsion Laboratory

## NExSci Exoplanet Archive Users Group Recommendations

Dear Dr. Beichman,

It is my pleasure to provide you a summary of the recommendations of the *NASA Exoplanet Archive Users Group*, based on the in-person meeting led by Dr. David Ciardi and held at IPAC on 2018 February 13th, with a follow-up telecon on June 11th.

The *Exoplanet Archive* is the primary reference source for confirmed exoplanets for NASA and its Exoplanet Exploration Program. The *Archive* contains a vast, up-to-date and comprehensive warehouse of peer-reviewed information on exoplanets, and provides tools for the community to access, explore, and contribute to these data. The *Archive* also hosts high-level data products and documentation for NASA exoplanet Missions. The *Users Group* is tasked with providing feedback to NExSci on the content and functionality of the *Archive* to help optimize the *Archive's* holdings and usefulness to the astronomical community. With these goals in mind, we summarize the outcome of our meeting and list our recommendations and priorities.

At the meeting we were presented with a review of recent *Archive* activities and accomplishments, usage statistics, the current status of the *Archive*, the response to prior *Users Group* recommendations, and the vision for the future. The *Users Group* is pleased with the actions taken on prior recommendations, particularly the continued ingestion of data, the development of ExoFOP for TESS, the release of the ExoFAST tool, and work done on Filtergraph and the microlensing suite of tools. We look forward to seeing full deployment of the work in progress in the near future ( $\sim$  summer–fall 2018). The *Users Group* re-affirms its advice that, for an archive, making data available for users takes priority over providing tools to analyze data. In particular, incorporating the TIC/CTL and GAIA data (DR2 now; DR3 and DR4 in the future) are very high priority. Nevertheless, having analysis tools available adds much value to the *Archive* and we support their development, maintenance, and detailed documentation.

More specifically, the *Users Group* makes the follow prioritized list of recommendations for the near future:

- The *Users Group* stresses the immediate need to be prepared for the TESS Mission. This includes documentation, ingestion of data, incorporating candidates and related information, including TESS GI Program data products, and full support of follow-up activities (ExoFOP-TESS). This should be the *Archive's* top priority.

- Continue the core mission of the *Archive*, assimilating confirmed (published) exoplanets and candidates, and making the data easily accessible to users: High priority
- Finish development of tools near completion, especially the Filtergraph: High priority
- Finish development of microlensing overplotting (i.e. generate models using parameter values from the *Archive* but do not attempt to fit data): High priority
- Continued development and enhancements of existing tools (e.g. ExoFAST, transit prediction ephemeris tool, periodogram tool): Medium priority
- Complete the time series statistics tool: Low priority
- Development of an enhanced periodogram tool: Low priority
- Development of direct-imaging exoplanet tables/tools: Low priority
- Development of VO integration: Low priority - but see below
- Development of an Orbit-Fitting Tool: Defer

For longer timescale endeavors:

The *Users Group* was excited by the NExScI's future vision for the *Archive*, namely:

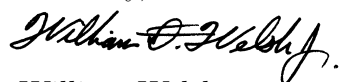
- (1) moving away from the current mission/survey specific approach to an “all-sky” source approach, based on the TIC and GAIA catalogs; and
- (2) use of an API-driven access environment. Both of these visions are highly endorsed.

We recognize the significant challenge posed by merging and cross-matching targets in widely different catalogs, but this more source-centered and comprehensive approach will in the long run ultimately be far more valuable than the current approach.

The *Archive* can't do everything – and should not try to. An API (Application Programming Interface) environment allows the user to employ their own tools (and/or tools provided by the *Archive*) to query the *Archive* however they need to, effectively providing endless flexibility. While this is a significant change in direction from the current web-based *Archive*, it is important to note that this is not being developed from scratch and IPAC has considerable in-house experience.

Finally, if the *Exoplanet Archive* is interested in expanding its user base from professional astronomers to amateur astronomers and fostering more “pro-am” collaboration (especially for TESS FOP), then having a representative from the amateur community in the *Users Group* is recommended.

Sincerely,



William Welsh

NASA Exoplanet Archive Users Group (Chair)

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*Current NASA Exoplanet Archive Users Group Membership:*

Laurent Pueyo (STScI), Josh Shlieder (GSFC), Keivan Stassun (Vanderbilt), Rachel Street (LCO), William Welsh (SDSU), and Jennifer Yee (CfA Harvard-Smithsonian)