

MINUTES OF THE KEPLER USERS PANEL
6-7 September 2010
Building N244, NASA Ames Research Center, Moffett Field CA

Prepared by: Alex Brown, Chair

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Members Present: Patricia Boyd (by telecon), Alex Brown, David Ciardi, Bernie McNamara, Richard Mushotzky (by telecon), Joshua Pepper, Lucianne Walkowicz, Nick Gautier [Executive Secretary].

Members Absent: None

Others: Jessie Dotson, Mike Haas, Doug Hudgins, Martin Still, Charlie Sobeck

Welcome and Charge to Panel – Nick Gautier

Nick welcomed the Panel members and outlined the role of the group and how it can help support the future of the Kepler project.

Alex Brown was elected as Chair of the Panel. It was decided that members should be appointed for 2 year terms and that new members should be appointed annually.

Nick Gautier, in his role of Project Scientist will be the Executive Secretary of the Panel.

NASA Headquarters Information – Doug Hudgins

Doug outlined the current budgetary position and the situation faced by the Kepler Mission, with strong Decadal Review support but facing the end of its prime mission in the not too distant future. Extension of the project will depend critically on how strong a case can be presented to the 2010 Senior Review.

Science Office and Science Operations Center: activities and status – Mike Haas

Mike gave an extensive description of the organizational structure of the Kepler Mission and a detailed overview of the data flow and data processing system. He described how the different data products are currently produced by the pipeline and their deficiencies.

Archive Status – Jessie Dotson

Jessie outlined the data archive processing time-line and the data release plan. She highlighted areas where the current data products are lacking in important information and the potential confusion that this may present to archive users.

GO Program Status – Martin Still

Martin outlined the growth of the GO program from its shaky start in Cycle 1. He highlighted a diverse set of “astrophysics” results already found with Kepler and proposed ways that the role of non-transiting-planet science can be enhanced and supported, both in the upcoming Cycle 3 and in an extended Mission.

Science Content for Extended Mission – Nick Gautier

Nick led an extensive discussion concerning proposal preparation strategy for the 2012 Senior Review. The proposal should be “science-based” and the various science components should mesh seamlessly. Development of a strong, broader, “astrophysical” component for the Extended Mission phase is likely to be vital for a favorable response from the Senior Review. Growth of the GO part of the Mission seems fundamental to any viable Extended Mission.

Discussion and Recommendations by the KUP

1. Kepler Archive, Data Products, On-line Tools, and GO Support

The KUP made the following recommendations relating to data products:

- The Project needs to define a set of well-calibrated data products that are archived in standard (FITS) formats and that preserve all the relevant information needed to facilitate the wide range of astrophysical investigations possible with Kepler data.
- The current data processing by “PDC” is optimized for transit studies but can severely modify or remove real stellar variability. Development of a processing method, dubbed “PDC-lite”, that removes only true instrumental effects from the photometric time series is urgently required.
- Data analysis and visualization tools suited to the needs of users must be more obviously available. Some of these may be found by utilizing existing resources, such as the time series periodogram tool of NStED and other well-developed timing analysis packages, or new software whose development will need to be encouraged.
- Improved data tools for Kepler data could be generated using the PSP (Participating Scientist Program) call to emphasis and encourage work on Kepler software tools and data processing.
- Kepler Auxiliary data need to be made accessible to the community.
- Non-standard aperture data must be released to the public in a timely manner - this needs to include both pixel level data and time series data.
- KSAS and its contents should be released to the public and preparations should be started to allow this.

- It is desirable that a dedicated set of scientists and programmers be available in the GO office, who could better to support the general users of Kepler data and provide the new data and software products in a more timely manner.

2. Better Documentation and Communication with the Wider Community

The KUP made the following recommendations relating to better and simpler access to information regarding the Kepler Mission and Kepler data suited to the needs of the astronomical community:

- The Kepler Mission archive at MAST should provide clearer information relating to the processing methods used to produce the archived data. Time series and visualization products should include processing version information and planned upcoming re-processing dates should be well advertised. When data are reprocessed, older versions should still be retained and accessible at MAST.
- Documentation is needed on how to use Kepler Auxiliary data.
- Clearer access to the Guest Observer website from the Kepler Mission webpage is urgently needed and development of better compartmentalized "For Astronomers" webpages within the GO website is important.
- Better documentation of data analysis techniques and more complete FAQs would be very helpful. The GO office should try to provide recipes for how to analyze Kepler data using a range of different available data analysis tools/packages. Potentially, the user community itself can be encouraged to document such recipes.
- A paper describing the KIC and how it was constructed needs to be written as soon as possible, because the KIC is central to the understanding of the Kepler target stars. The associated uncertainties need to be assessed with special attention to the quality and limitations of T_{eff} , $\log g$, and $[Fe/H]$.
- Wider interest in the Kepler Mission among the wider astronomical community could be fostered by providing a "Kepler User Email exploder", organizing data processing workshops, and publicizing the availability of the quarterly discretionary time and the Full Field images (FFIs).

3. Timing of Kepler Data Releases

The KUP has some serious concerns regarding the current data release policies and their consequences:

- The data release timetable will severely limit the possibilities for Kepler ADP proposals and the Q2 data release data should be moved forward so that these data are available to potential proposers at least one month ahead of the ADP deadline.

- We have serious concerns regarding the lack of public data release to the astronomical community during the mission time frame particularly with the coming Senior Review (SR) in 2012. By the time SR proposal submission is due, only Q0/Q1/Q2 data will be public. The Senior Review process will critically examine each mission’s contribution to the whole astronomical community — by moving some data releases earlier the Kepler project can strengthen community access and science potential without compromising the exclusive use of the data needed by the Science Team.
- General moving up of data releases is encouraged - we are concerned about the slow release of data to the public and the negative impression that this is producing. Ideally, “Quarter per quarter” releases starting with the June 2011 Q2 data release would be highly beneficial for stimulating broader astrophysical investigation of the Kepler archive. (With this arrangement the Science team would have still have sole access to data 1.5 years before it became public).

4. Preparation for the Kepler Extended Mission and the 2012 Senior Review

The KUP feel that it is important to begin the complex process of developing the Senior Review proposal for a Kepler Extended Mission:

- Astrophysics will need to be a major component of the SR proposal in addition to plans to extend the exoplanet science beyond the prime mission and these components must be carefully linked scientifically.
- The “astrophysics” program should be expanded by \sim an order of magnitude - through the GO program, KASC, and PSPs — to foster the wider use of Kepler to address major astrophysical issues. This recommendation is driven by the concern for survival at the SR and making the Mission more appealing to the general community.
- The KUP should actively participate in the writing and planning of the SR proposal.

Future Meetings:

Ideally each 6-monthly KUP meeting should proceed the SWG meetings by a few weeks, but this may not be feasible. Tentatively we plan our next meeting for roughly March 2011.