

# Charter of the KOINet working group

## 1. Introduction

There is no doubt that Kepler is the most successful planet-hunting telescope in history. However, due to malfunctions the observations of the Kepler field came recently to an end. Therefore, the fate of many planetary systems that could have been confirmed and characterized via transit timing variations (TTVs) became uncertain. Since there are no forthcoming missions similar to the Kepler space telescope in the near future, it is important to arrange ground-based observations now, with the main goal of continuing Kepler's heritage. This has been captured in the framework of a multi-site and multi-institutional network called KOINet. The present document is intended to show and make clear, right from the start, the basic operating principles of the network. It is our intention to minimize any misunderstandings that could appear during the operation of the network, with the main goal to focus our efforts in the production of scientific data and results.

## 2. Goal and main tasks of the KOINet working group

The main goal of the network is to characterize extrasolar Kepler's planet candidates by means of the transit timing variation technique. Other goals include observing Kepler eclipsing binaries, and targets from the K2 mission. Further uses of this global telescopes network can always be discussed and implemented within our group. To reach our goals the working group members are expected to contribute with the following basic tasks:

- To follow-up photometrically the primary transit events of the pre-selected Kepler Objects of Interest (KOIs) in a "homogeneous" way (see Appendix I for further details).
- To complete every observed night an observing log as will be specified in Appendix I.
- To write proposals, when required.
- To plan individually the observing routine of robotic telescopes.
- To analyze the photometric data to study and characterize the KOI systems.

## 3. Basic communication of the group

To facilitate the communication within the group, a mailing list has been created. The mailing list can be found under the following link:

<https://listserv.gwdg.de/mailman/listinfo/koinet>

It is the duty of every participant to join the mailing list. A potential participant will not be considered as one until he/she has not been properly subscribed to it. Subscriptions should be done using a full name and an *institutional email*. The acceptance into the mailing list is done by an administrator. Therefore, to be accepted can take up to 3 working days. All emails that will circulate within the mailing list *are confidential* since it will contain information that will be discussed within the group. Please, don't share it to anyone outside the group.

Working group teleconferences will start on April and will be every 4 weeks during observations (March to November) and every 3 weeks once the observations are already collected, when we can focus in the analysis of the data. The telecons will be carried out at 6pm GMT and will last about 1 hour. The dial-in information and agenda will be distributed before the telecon and a resume will be distributed after it. To arrange the agenda and take notes, one person from the network will be selected. Everyone is invited to take part in the telecons. If telecons are not required, an email will be sent.

Other information will be shared via a dedicated web page including all necessary information to carry out the observations as efficiently as possible, along with new light curves, target lists, transit time predictions, data analysis and resultant papers, among others. All this information can be found under the following link:

<http://koinet.astro.physik.uni-goettingen.de>

Once an observer has signed in to the group, he/she will be provided with the unique user and password to access to the “News” link in the web page, where the photometric data can, by instance, be uploaded. Therefore, it is the duty of every member of the KOINet to plan and prioritize their observations with respect to the network’s performance as a whole, as discussed in the telecons, emails and web page.

#### **4. Promotional allowance of KOINet**

Until a first publication is out, allowance for KOINet’s researchers to present posters, give talks, and write talk/poster proceedings about KOINet has been given. The basic rules are the following:

- Under the News section a web page is being build. The page will contain plots such as acquired primary transit light curves and O-C diagrams that researchers within the collaboration can use to promote our collaborative work.
- Each plot will count with useful information such as the basics on data reduction, detrending, and fitting.
- Following the spirit of the charter, as authors of the presented talk should be listed the researchers who are presenting the poster/proceeding/talk, the KOINet researchers involved with the telescope that acquired the data that will be used in the promotion, and the PI. At the end of the author list it should be stated “ ... and the KOINet collaboration”.
- The PI should check the content of what is going to be presented at least 4 days before the presentation date.
- Posters, proceedings, and talks (only dates and conferences) will be collected and will be available to the community as advertisement of KOINet.

#### **5. Publications**

- Once the network is operational, a paper will be produced presenting the network and showing first results. All of the KOINet members at that time will be co-authors to that paper. The initial paper will be led by the PI and the Göttingen group and the remaining participants will be arranged alphabetically.
- From then on, only if an observatory acquires data from the KOI that is being under study, then the participants involved with that observatory will be included in the paper by default. Participants whose observations of a given object failed (technical problems, weather, etc.) will also be included in the mentioned publication if they can demonstrate a serious effort to obtain their data. This is intended to motivate and value the observers work. However, to be fair to the rest of the group the observers will have to show proofs of bad weather conditions (for example, pictures of the sky, either from a satellite or an observatory monitor) with clear dates and times on them. Other ways this will not be considered. This, in turn, is not valid for robotic telescopes. Staff at a given observatory where time has been granted via a regular proposal is not considered as observer. Only members of the KOI network that have direct access to the telescopes do.
- The first-authorship of the publications will be, generally, given to the members of the network that will carry out the data analysis. Then, the remaining order of the observers will depend of a compromise between the amount of data and their quality acquired with respect to that object(s).
- If you agree to be part of the network, then you agree that the publication of the observations from KOINets targets must be coordinated within the collaboration.
- All light curves published by KOINet shall be made available on, for example, the Exoplanet Transit Database (ETD, var2.astro.cz).

## 6. Organization structure

In order to promote the work and focus our valuable time into science-related topics, the KOINet group will have the following structure:

- Initially, the hosting institute of the project is the Institute für Astrophysik Göttingen.
- Chair: the role of the chair is to serve as point of contact for the working group, to organize telecons, to do the agenda, to be the mailing-list administrator, and to organize other relevant issues. It will start with the PI of the KOINet and will be changed every 2 years.
- Board: KOINet's board will provide scientific guidance and oversee the observations and analysis of the data. The Board will also decide on any issue that is related to conflicts between members. Initially the Board will be conformed by C. von Essen, A. Ofir, S. Dreizler, H. Deeg and K. Poppenhaeager.
- We expect the KOINet to grow. As the point-of-contact, the PI is allowed to reject applications that are not deemed compelling. However, membership will be decided by the Board. A member can only be part of the network if he/she is providing with considerable telescope time or shows proof of TTV analysis skills. He/she will have the right to be part of one telecon where an explanation of his/her contribution to the network can be produced. A normal vote will be produced. Any unclear result (by instance, an even yes and no decision for membership) will be defined by the chair.
- The uncoordinated publication of data acquired within the framework of this network may lead to expulsion from KOINet, following a decision by its board.

## Appendix I: Observing details

- The observations will be graded with respect to their completeness and correctness. The grades will be 1 for complete and correct observations and 0.5 for incomplete or incorrect ones. This grading will be considered in the publication stage.
- Calibration frames should be acquired according to the filter and binning configurations of choice (skyflats, bias and dark frames).
- Science images should be acquired using a Johnson-Cousins R filter or similar. I-filters are discouraged. If the filter is not standard, then the observatory has to provide the transmission function of the filter.
- Observers are free to take any other required step to produce good quality photometric data (defocusing, guiding, windowing, etc.), in compromise with a Kepler-competitive cadence (not more than 5 minutes per exposure, readout time included).
- Once the images are acquired, a night report has to be send to Göttingen via the following web-page:

[http://koinet.astro.physik.uni-goettingen.de/News/Night\\_Report.html](http://koinet.astro.physik.uni-goettingen.de/News/Night_Report.html).

Please add there all relevant information such as changes in the atmospheric transparency, in the cloud coverage, the phase of the Moon, how close the Moon was to the target, any problem with the CCD associated, by instance, to the cooling system, etc.

To improve the predictions as time passes by, it is very important to send the data as soon as possible. Observations without at least 10 bias frames, 10 dark frames which exposure time should be the maximum exposure time of the science frames (only when dark current is a predominant noise source), 10 skyflat frames acquired in filter Jonson-Cousins R, and the science frames acquired in the same filter, binning and windowing configuration, *are not encouraged and will be badly graded*. Bias frames are encouraged to be

acquired before and after the observations. Due to potential changes in the weather conditions flats can be acquired either at the beginning or the end of the observing run, but before and after is preferred. Skyflat counts have to be around 1/3 and 1/2 times the dynamic range of the CCD. If weather conditions are too poor to acquire skyflats during the observing run, flats from previous nights are also acceptable ( $\pm 1$  week). Domeflats can also be acquired, specially under poor weather conditions. However, skyflats are preferable.

- The keywords DATE-OBS with YYYY-MM-DDThh:mm:ss of the middle of the exposure in UT, the exposure time, the right ascension and declination of the target star, the gain in e-/ADU, and the readout noise in e-, are strictly required. If the observer does not have them available then he/she should add them via the data acquisition code options. If this is not possible, then a comment has to be added in the night report under “Others”, specifying the keywords setup.
- Any observation that falls in a proposed transit window (see the “Events” link in the KOINet web page) counts as a observation, whether the transit is observed or not. This is motivated due to the fact that non-detection is also useful to improve the TTV predictions.
- In the KOINet web page the most adequate reference stars will be indicated (see “Catalog” for details). The observer is excused to use the indicated reference stars only if the field of view does not allows it. If this is not the case and the observer does not respect the indicated reference stars, then the observations will be badly graded.
- To ensure homogeneous light curves, the final data reduction will take place in Göttingen. Therefore, the observer has to submit raw data only. Data submission is under development (20.04.2014).