Korea Astronomy and Space Science Institute

Call For Science Proposals for Korea Microlensing Telescope Network (KMTNet)

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1 Overview

The Korea Microlensing Telescope Network (KMTNet) is a wide-field photometric system operating by the Korea Astronomy and Space Science Institute (KASI). The system consists of three 1.6m wide-field optical telescopes equipped with mosaic CCD cameras of 18k by 18k pixels. Each telescope provides a 2.0 by 2.0 square degree field of view (FOV). Three telescopes and cameras were installed at the Cerro-Tololo Inter-American Observatory (CTIO) in Chile, the South African Astronomical Observatory (SAAO) in South Africa, and the Siding Spring Observatory (SSO) in Australia. This network of telescopes, which is spread over three different continents at a similar latitude of about -30 degrees, enables 24-hour continuous monitoring of targets observable in the Southern Hemisphere (Kim et al. 2016, JKAS, 49, 37).

The primary scientific goal of the KMTNet is to discover numerous extrasolar planets toward the Galactic bulge by using the gravitational microlensing technique. Therefore, the bugle observation time for the primary science has been already allocated. The non-bulge season will be open to the Korean astronomical community.

This document describes the Call For Proposals for the second run of the KMTNet scientific operation. The first five-year run will finish on September 30, 2020. This second run is scheduled to start from October 1, 2020 and to carry out for three years till September 30, 2023.

Following shows a list of important milestones.
- April 8, 2019: Release of the Call For Proposals
- June 30, 2019: Deadline to submit Proposals
- August 15, 2019: Review of the submitted Proposals
- Early-September, 2019: Selection of the Proposals and KMTNet workshop
- October 1, 2020: Start of the second run

2 Summary of the KMTNet System

The following table summarizes important information about the KMTNet system.

Telescope	- Primary mirror of 1.6m in diameter - Fork-type equatorial mount - Prime-focus optics with four wide-field correcting lenses - Delivered Image Quality less than 1.0 arcsec FWHM within 1.2 degree radius FOV for I-band (under atmospheric seeing of 0.75 arcsec) - Optical performance optimized in I-band - Drawer-style filter changer to mount four filters simultaneously - Johnson-Cousins BVRI filters in all three sites - SDSS griz filters and H alpha filter in the KMTNet-CTIO site - Filter size of 310 mm x 310 mm and the thickness of 10 mm - Sliding shutter with rectangular blades, minimum exposure of 1 second
Camera	- 18K by 18K CCD mosaicked with four 9K by 9K e2v chips - Pixel scale of 0.40 arcsec, 2 by 2 square degree FOV - Quantum efficiency of ~85% in V-band and ~80% in I-band - 16 bit ADC and readout noise of about 10 electrons - The overhead time of about 70 seconds in total, including readout time of about 30 seconds with 32 readout channels (8 channels/CCD) - CCD chip cooled down to about -110 degree Celsius
Site and Observation	- CTIO in Chile: time zone of +4 hour - SAAO in South Africa: time zone of -2 hour - SSO in Australia: time zone of -10 hour - Observations by resident observers at each site
Data Handling	- All of raw CCD images are transferred to the KMTNet data center at KASI via internet - The raw images are preprocessed by the KMTNet pipeline - Researchers can access the preprocessed images within two days

3 Science Policy

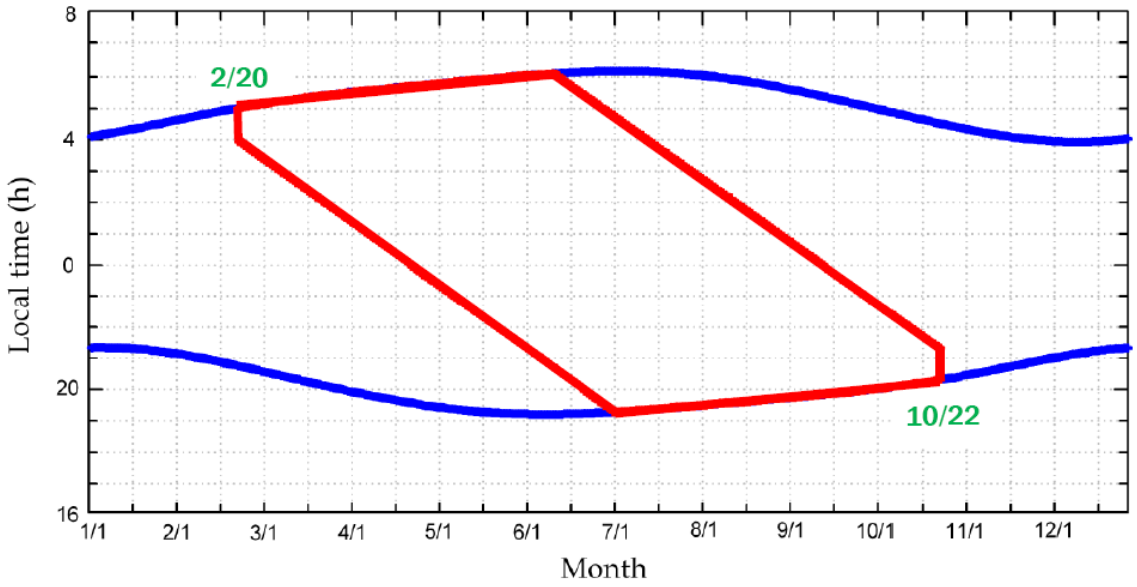
Researchers who plan to use the data obtained with KMTNet should follow the science policy as described below. Note that **all proposal applicants are assumed to agree with and also to observe this policy**.

3.1 Observation Time Allocation

Observation time to monitor the Galactic bulge has been already assigned to the KMTNet primary science. It corresponds to about 45% of total observation time. About 10% will be allocated for the director time and for the system maintenance. And another 10% will be awarded to each host site.

About 35% of total observation time will be open to the Korean astronomical community and be assigned to the KMTNet secondary sciences (i.e. accepted proposals) during the non-bulge season. It corresponds to about 1,150 hours per year per site.

The following graph shows the bulge observing time in red color between 20 February and 22 October as well as the non-bulge one in blue at CTIO in Chile. This pattern is almost identical to the other two sites because of their similar latitudes.



3.2 Evaluation

The submitted proposals will be examined by several special reviewers. Based on the review results, the KMTNet team will select science cases for the second run and assign observation time. Proposals with low priority will not be accepted.

The accepted and executed observation programs should present their on-going status and future plan at the KMTNet workshop, normally held at KASI once every year. Poorly performing programs may be terminated before the nominal proposed end of the program based on decisions made by the KMTNet advisory committee.

3.3 Data Release to the Public

The regular proprietary period of the data obtained with the KMTNet is one year; after which, all the data will be publicly available at the KMTNet website. This period may be extended up to three years with approval of the KMTNet advisory committee.

3.4 Publication of the KMTNet Data

All the publications based on the KMTNet data shall follow the guidelines for publications as below.

- All papers using the KMTNet data should include the word 'KMTNet' at the title or abstract.
- The papers should include at least one KASI staff member as a co-author. The KASI staff participating in the research team of the proposal will review the observance of the publication guidelines before the paper submission.
- At least one paper, which is specified by the KMTNet operation team, should be cited as a reference.
- The papers should include the following acknowledgement, "This research has made use of the KMTNet system operated by the Korea Astronomy and Space Science Institute (KASI) and the data were obtained at three host sites of CTIO in Chile, SAAO in South Africa, and SSO in Australia."

4 Contents of the KMTNet Observation Proposal

The proposals boosting scientific capability of KASI and producing synergy with the existing KASI research activities are favorable. The proposals collaborating with researchers at host countries (i.e. Chile, South Africa, and Australia) are encouraged. Proposals for similar research topics may be advised to be unified during the review process. Therefore, discussions for collaborative research are recommended before the proposal submission. The proposals should be less than five pages and written in English.

4.1 Research Title

4.2 Organization of Research Team

- Name/Affiliation/E-mail of the Principal Investigator (PI) and all collaborators
- The proposals should include at least one researcher working at KASI.

4.3 Abstract

4.4 Observation Method

- Wide-field Survey, Monitoring, or Target of Opportunity (ToO)
- Observation Target(s) and Spectral Filter(s)
- Site(s): observation at all three sites or any specific site
- Requested Time: number of nights, lunar phase, seeing condition, etc.

4.5 Scientific Justification

- The description should be less than two pages, including graphs and references.

4.6 Feasibility and Adequacy

- Describe the feasibility of using the KMTNet and justify any special requirements (e.g. site preference, specific time, and/or specific filter).

4.7 Recent Publications of the PI within Five Years

- List only the papers closely related to the proposals.
- If the PI is the previous user of KMTNet, list separately the papers used the KMTNet data.
- A long list of publications can be attached as an appendix.

4.8 Expected Outputs

- Describe the expectation from the proposed research program, both qualitatively (e.g. scientific impacts) and quantitatively (e.g. number of papers per year).

4.9 Remarks

- Justify extension request (if any) of the proprietary period (see section 3.3).
- Describe the other requirements such as additional filters for better results.