

December 5, 2018

Members of the W. M. Keck Observatory Community,

On November 16, 2018, the WMKO Director, Hilton Lewis with approval from the CARA Board updated the WMKO policy for target-of-opportunity (ToO) observing. The update of the policy is intended to better account for anticipated follow up observations associated with gravitational-wave (GW) events. The new policy is based on recommendations from the SSC and the EM-GW sub-committee tasked to formulate the policy recommendations.

The policy is effective immediately, the formal policy details are included below, and key highlights of the new policy are as follows:

WMKO will retain its “first-come, first-served” policy and increase the number of Partnership ToOs from one to two per night per telescope. (1) Multiple ToOs per night will allow observations with different instruments and at different times in the evolution of each GW event. (2) Multiple teams will have the opportunity to obtain data on each event. For each telescope, one partner may expend one Partnership ToO per night, which allows another partner to use a Partnership ToO. Additional ToOs may be possible via Institutional ToOs. Each institution has specific rules and policies for ToO interrupts and are not covered here.

Switching of instruments during the night for ToOs will be permitted on a limited basis. The Observatory will initially allow switching only for Partnership ToOs, starting in 2019A. Keck I instrument changes will be fully flexible in 2019A with up to 3 instruments with use of the newly commissioned K1 Deployable Tertiary Mirror, K1DM3. Keck II instrument changes for partnership ToO's will only include NIRES starting December 14, 2018.

Fractional nights and nights assigned to minor partners are no longer exempt from interruption. WMKO follow-up of gravitational wave events will have priority. WMKO Director nights and engineering nights are also interruptable to the extent that it's technically feasible.

In order to initiate a ToO, observers must log in to the WMKO Observer Home Page and use the ToO GUI to select a specific night, time, telescope, instrument configuration, and coordinates for their ToO.

The first come first served policy will be coordinated with the ToO trigger GUI software. Partnership ToOs will have priority over institutional ToOs .

Sincerely,

Hilton Lewis
WMKO Director

Policy for Partnership Targets of Opportunity at WMKO

This policy is an update of the policy originally approved by the Director as recommended by the Science Steering Committee in June 2016 and updated in January and August 2018. For clarity the full policy is duplicated here and November 2018 changes are indicated in red.

Target of Opportunity (ToO) proposals are directed at objects with unpredictable appearance dates for which a short, timely observation (up to one hour) may be of great value. ToO programs are not intended for observations that can be anticipated in advance (e.g., Cadence observations).

Proposing for Partnership ToOs

- 1) Caltech, NASA, UC or UH researchers can propose to their respective TACs for cross-institutional ToO (“Partnership ToO”) observations on Keck 1 and/or Keck 2. TACs should award Partnership ToOs only for highly ranked programs. **These programs may interrupt programs assigned to any institution, including programs with partial-night allocations.**
- 2) Each TAC will judge their respective community’s proposals. **NASA and UH TAC’s can allocate up to six triggers for Partnership ToO observations per semester. CIT and UC TAC’s can allocate up to seven triggers for Partnership ToO observations per semester.** The duration of each trigger shall not exceed one hour. Each TAC will submit a list of approved Partnership ToOs as well as their full proposals to WMKO as part of the routine reporting of successful proposals.
- 3) Individual TACs may designate a few nights (partial or whole) as exempt from ToO interrupts. This designation must be scientifically motivated, namely that such interruptions would seriously compromise the scientific return of the entire observing time. Proposers should make any such requests to their individual TACs as part of their observing proposal. Use of these exemptions is expected to be rare. Nights should be designated as “uninterruptible” by the institution’s scheduler during the semester scheduling process, via the scheduling tool.

Scheduling Partnership ToOs

- 4) **ToOs may be scheduled at any future time in the semester in which they were awarded.**
 - a) **In order to initiate a ToO, observers must log in to the WMKO Observer Home Page and then use the ToO GUI to select a specific night, time, instrument configuration, and coordinates for their ToO. Both Partnership and Institutional ToOs shall be scheduled through this interface.** The WMKO web interface will be the sole source for managing the triggers, **i.e., no arrangements via phone calls or emails to the classically scheduled observer (a.k.a. the “Observing PI” hereinafter).**
 - b) Any ToO program that requires LGSAO must be invoked and the target coordinates submitted prior to 3:00 pm HST on the day of the observing run. ToO programs that require LGSAO can only be invoked on regularly scheduled LGSAO nights.

- c) ToOs are expended when they are scheduled, not when they are executed. Teams will not recover ToOs if the observation is canceled or unsuccessful for any reason (e.g., weather or instrument fault).
 - d) The public interface of the ToO GUI shall indicate the time, instrument, telescope, instrument configuration, and ToO PI of any scheduled partnership interruptions. Once a ToO is scheduled, the contact information for the Observing PI and the ToO PI(s) will be shared with each other, to facilitate coordination of the observing.
- 5) Partnership ToOs are limited to two per telescope per night. A single partner may not use two Partnership ToOs on the same telescope in one night, but they may use two Partnership ToOs to interrupt both telescopes on the same night.
 - 6) Partnership ToOs may displace already-scheduled Institutional ToOs at any time, unless the Institutional ToO is already underway. A ToO observer may wish to expend a Partnership ToO, even when the Observing PI is from the same institution, in order to avoid being displaced by another potential Partnership ToO. Likewise, an Observing PI may choose to call a Partnership ToO on their own night in order to prevent displacement from another team with a Partnership ToO.

Observing Partnership ToOs

- 7) For each ToO interrupt, the maximum duration is 1 hour of elapsed time (i.e., wall clock). This includes calibration and restoring the instrument mode to its state prior to the ToO interrupt or to another state as mutually agreed with the Observing PI.
- 8) The Observing PI will make best efforts to promptly turn over the telescope to the ToO PI **at the scheduled ToO time**. The observer may briefly delay handover of the telescope in order to complete their current exposure or essential observing sequence (e.g., one AB nod pair). After that, it is expected the Observing PI will yield the telescope to the ToO PI, unless the latter agrees to wait longer.
- 9) **ToO instrument changes will be allowed on a limited basis starting in the 2019A observing semester. Only instruments with “Ready” status as indicated on the ToO GUI via the observer login page and instruments designated in TAC-approved programs can be selected.**
- 10) It is the responsibility of the ToO team to carry out the observations. The ToO team may carry out the observations themselves. If remote observing, the team is responsible for making appropriate arrangements with the Remote Observing Room, including reservations and testing in advance. Alternatively, the ToO team may ask the Observing PI to carry out the observations, which will include an offer of co-authorship. The Observing PI is not obligated to do the observing.
- 11) Upon completion of the ToO, the ToO PI shall use the Keck web system to submit a brief summary of the execution of the ToO.

Time Accounting and Proprietary Period for Partnership ToOs

- 12) At the conclusion of each semester, WMKO will report to each partner the time used, the associated ToO programs, and the interrupted Observing PIs.
- 13) Time imbalances between partners arising from Partnership ToOs will be corrected through each partner's semester time allocations and/or WMKO's giveback science time. Because ToOs are likely triggered in suitably good weather, their time usage will be charged at a rate of twice the normal observing time, i.e., 2 hours. Any compensation to individual PIs interrupted by ToOs will be left to the discretion of the individual institutions.
- 14) The proprietary period for Partnership ToO data related to gravitational wave follow-up shall be 3 months. Partnership ToO data not related to GW follow-up will have the standard proprietary period protocols.