
Cadence observations on Keck

July 1, 2016: approved by SSC

Cadence programs are directed at objects for which short (<1 night) repeated observations during a semester are scientifically necessary. This Cadence observing program is not intended for observations that cannot be anticipated in advance (a.k.a., Target of Opportunity observations).

Implementation of Cadence observing at Keck encompasses two distinct aspects, both of which are addressed by this document:

1. **Partial-night scheduling:** Keck partners are making fractional time allocations as small as $\frac{1}{4}$ nights. Guidelines are needed to schedule these allocations in an effective manner.
2. **“Snapshot” observations:** some science programs require very short (~1 hour) observations, a capability which does not formally exist yet across partners.

We anticipate a 2-year trial period for this Cadence policy, with a review after the first year. Updates may be needed when the Keck-1 deployable tertiary becomes available.

1a. Caltech, NASA, UC, and UH researchers can propose to their respective TACs for time intervals in units of whole, $\frac{3}{4}$, $\frac{1}{2}$, or $\frac{1}{4}$ nights. Requests for quarter nights must be intrinsic to the science program. Proposers should be aware that it may be infeasible for WMKO to schedule all partial-night allocations.

1b. In addition, PIs can propose for Partnership Snapshot observations of ≤ 1 hour in duration each. These should be requested for the start or the end of the night, unless essential for the science program. Proposers should be aware that it may be infeasible for WMKO to schedule all Partnership Snapshot allocations. TACs should award Partnership Snapshots only for highly ranked programs.

2. Each TAC will judge their respective community's proposals and inform WMKO of the resulting allocations. TACs do not have to agglomerate partial-night proposals into whole nights, but doing so will make it more likely that such programs will be scheduled. Each TAC can award up to a combined total of six Partnership ToO + Partnership Snapshot observations each semester.

3. To construct the telescope schedules including partial-night allocations, WMKO can use two methods. (1) The Observatory can fractionally redistribute the requested allocations within and across partners, while striving to maintain a net zero sum for each institution. For instance, a 2-night program may be scheduled as a 1 full night + 2 half-nights in order to enable half-night programs. Such fractional redistribution will be applied to $\sim 10\%$ of the allocated whole nights. (2) If necessary for Snapshot scheduling, the Observatory can reduce time allocations by up to one hour for any programs

that are at least one full-night in duration. When reducing allocations, the Observatory will consult with the partner institutions as part of the scheduling process.

4. For each night, no more than three programs will be scheduled, and there will be no more than two instruments used. For observing blocks shorter than a quarter-night, there will be no instrument changes.

5. It is the responsibility of the Cadence team to carry out the observations. If remote observing, the team is responsible for making appropriate arrangements with the Remote Observing Room, including reservations and testing in advance. Alternatively, the Cadence team may ask the regularly scheduled PI to carry out the observations, which will include an offer of co-authorship; the Observing PI is not obligated to do the observing.

6. For split nights with LGS AO, the Observatory will maintain separate starlists for all the PIs, if requested.

7. Individual TACs may designate a few nights (partial or whole) as exempt from Cadence blocks. 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 occurrences.

8. Time imbalances between partners will normally be corrected through each partner's semesterly allocations and/or WMKO's give-back science time.