

Approval process of PI-type instrumentation program to Subaru Telescope

Subaru Telescope New Development Group

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1. Definition of PI-type instrumentation program

The observatory expects a PI-type instrumentation program can be of multiple types such as:

- Development of a new instrument for carry-in to Subaru
- Carry-in of an already-built instrument to Subaru
- Modification (including addition of extra component(s)) of an existing Subaru instrument for upgrades.

The observatory welcomes not only programs that aim at being scientifically productive in its operation phase, but also those purely for engineering purposes such as a demonstrator of novel technology and application.

Although details can vary from program to program, a PI-type instrumentation program is basically executed by PI's resources external to the observatory.

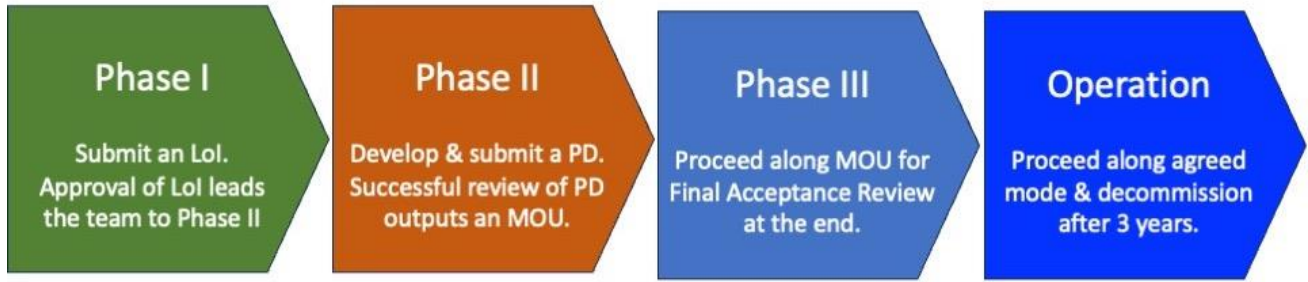
2. Scope of this document¹

This document is to describe the procedure for a PI-type instrumentation program to be proposed, approved, implemented to and operated at Subaru Telescope. The procedure described below is applied to all program types, while the observatory is aware that details may need to be optimized upon demands case by case.

3. Procedure

Overall, a PI-type instrumentation program is proposed, reviewed, approved and implemented in a staged manner with a few phases as follows:

¹ The procedure for carry-in of a new filter and grism is outside the scope of this document and is different from instrument and instrument. Please see <https://www.naoj.org/Observing/Instruments/index.html> and contact Support Astronomer for details.



Phase-I: The scope of this phase is for the observatory to be aware of PI-type programs even if they are very preliminary. For this purpose, we request PI to summarize the concept of his/her program in Letter of Intent (LoI) and submit it to Director of the Subaru telescope observatory. The guideline of LoI is available in the later part of this document. There are two points of consideration here:

- PI should feel free to contact observatory staffs in writing an LoI, but according to the scope of this phase, the observatory can allocate no or very little resources to support PI, so the observatory encourages PI to prioritize submitting an LoI even though lots of details remain to be open.
- If PI submits a funding application related to a PI-type program, he/she is requested to submit an LoI at this time (as well as at other opportunities independent of funding application) so that the observatory can keep such future prospects in mind.

After the LoI is reviewed in the observatory, Director will send an approval or disapproval to PI accordingly with comments. In case of an approval being given, the PI and his/her team can step forward to Phase II. Via the approval from Director, the PI may receive requests from the observatory to be addressed in the next phase for which the observatory may allocate some resources for essential supports.

Phase-II: Once the LoI is approved, the PI and his/her team can develop the concept further, put some more details together into a proposal document (PD) and submit it to Director. Again, the guideline of this PD is available in the later part of this document. The observatory will then define an internal review committee (IRC) which will coordinate a review process consisting basically of iterative discussions with the PI team and review meeting(s). Subaru Advisory Committee (SAC) will be involved in this review process appropriately under the IRC's coordination. A review scope may vary from program to program and depend on circumstances of the observatory, but the followings are basic points to be reviewed:

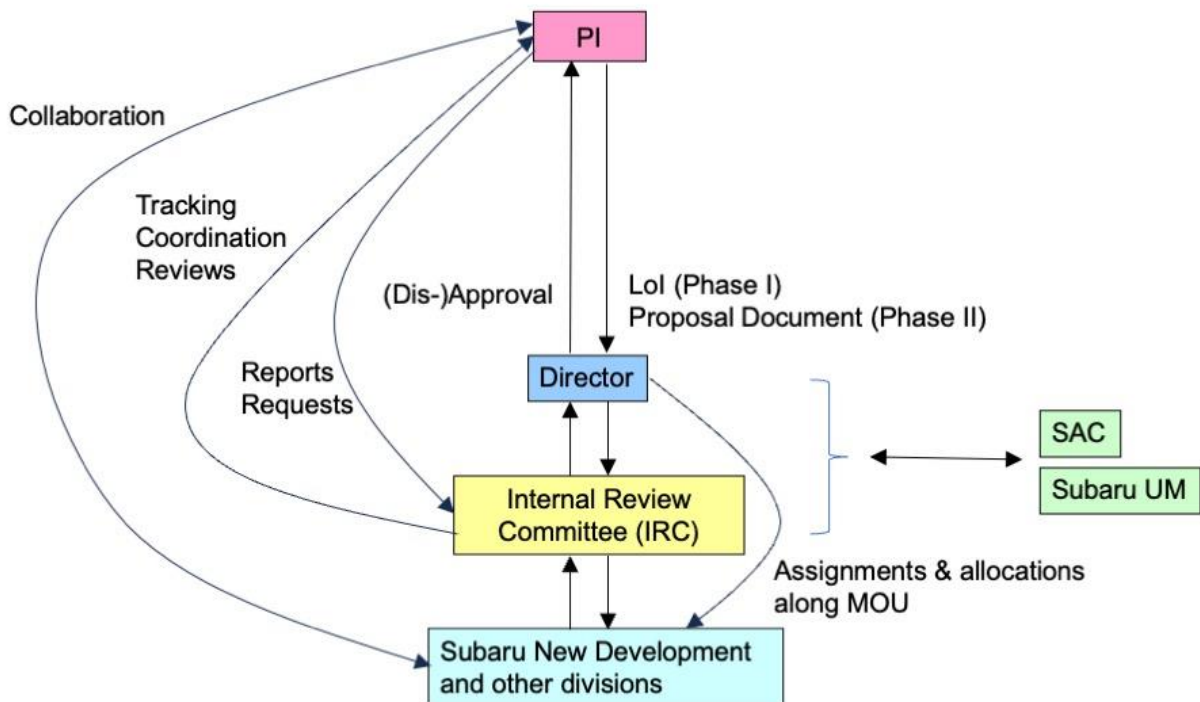
- Science/engineering merit
- Uniqueness by implementing the program on Subaru
- Feasibility and risks (for both the PI team and the observatory)
 - ☞ Compliance to the specifications
 - ☞ Fitness to the telescope and infrastructure (F/#, size, weight, power consumption, heat dissipation, coolant usage, networking, safety compliance, etc.)

- ∞ Financial and human resources
- ∞ Schedule
- ∞ Compliance to Subaru's safety regulations

In case of the review being successful, the key output from the review process is a written agreement between the PI team and the observatory about such items as follows that specify how they collaborate in the next phase:

- Responsibilities of the PI team and the observatory
- Mode and term (see Section 4) of instrument operation on the telescope
- Decommissioning process
- Plan of resource commitments and managements

In this agreement, the observatory may nominate specific individual(s) or FTEs upon demands to fulfil agreed responsibilities and commitments.



Phase-III: The PI team and the observatory should proceed with actual developments such as detailed design studies, manufacturing, integration, and test according to the agreed plan of resource commitments and work assignments that comes from Phase II. The program perhaps comes to multiple milestones during this phase such as:

- Shipment of hardware and software to the Hilo base and then to the summit,
- Start of engineering works at the summit
- Start of daytime and nighttime engineering on the telescope

and so on. IRC coordinates review processes as required around some or all of such milestones, and the readiness of the instrument, PI team and the observatory should be reviewed through review document(s) (RD) and approved before the program moves forward to a next step. IRC defines review scopes (and what RD should cover) at each time optimally considering the personality of a given program and circumstances of the observatory.

There are a couple of requests to the PI team during this phase:

- (1) If this phase takes longer than six months, the PI team is requested to report the status of the program to the chair of IRC every three months so that the plan of the observatory's commitments can be reoptimized if needed.
- (2) Also, the PI team is requested to give one or more poster presentations at every Subaru Users Meeting and share the status and future perspectives with the community.
- (3) PI team is requested to give a summary of updates weekly to Subaru New Development

After all engineering processes are complete, IRC coordinates a Final Acceptance Review to confirm key items as follows:

- Basic instrument parameters are delivered.
- Demonstrated on-sky performances are sufficient for proposed science/engineering cases.
- Procedures are well established for efficient instrument operation such as startup at the beginning of a night, data acquisition during a night, and shutdown at the end of a night.
- Decommissioning plan is well developed.

4. Operation phase

- Mode of instrument operation and data management

After final acceptance is issued, observing time can be requested with the instrument from the PI program. The observatory anticipates strategies of instrument operation and data management may differ from program to program, but given it is a scientific instrument developed and implemented with a significant amount of observatory's resources invested, it is highly recommended to open it to the community. In this case, acquisition of observing time is required to follow the same way as Subaru Open Use Programs. Instrument operation through Gen2 (second generation Subaru Observation Software System) and data generation & archiving in compliant manners to STARS (Subaru Telescope Archive System) are mandatory. The ownership of the data taken during nighttime observations should then be shared by both the

PI team and the observatory.

In case PI prefers to operating the instrument in a different way e.g. somehow more privately, some of the above requirements such as interfaces to Gen2 and STARS may be skipped. PI should describe and justify the planned operation mode in the proposal document so that necessary details can be agreed and arranged between the PI team and the observatory through discussions and negotiations in Phase II and Phase III.

- Term of instrument operation

Nominally PI-type instrument operation starts from the beginning of a Subaru semester and continues for three (3) years. We request to restore the telescope and equipment to their original state.

But if the PI wants to extend the operation period, he/she may submit an extension proposal document (EPD) to Subaru Telescope for a review². The review should be scheduled at least two (2) months before the issue of Call for Proposals and the proposal will be evaluated from such viewpoints as:

- Uniqueness of the instrument
- Importance of science cases
- Educational merits (instrument development, science, relation with theses) etc.
- Updated decommissioning plan

5. Documentation guideline

- LoI for Phase I

The LoI should consist of max. 2 pages and cover several specific contents as below:

- Program title
- Names and affiliations of PI and (if any) major team members
- Program type by choosing one of the followings: (1) development of a new instrument for carry-in to Subaru, (2) carry-in of an already-built instrument to Subaru, (3) modification of or addition of extra component(s) to an existing Subaru instrument for upgrades, or (4) other.
- Program description
 - Scientific and/or technical merits

² There is a discussion underway such that a review process should be needed anyway to share and evaluate how the program worked, regardless of whether or not PI wants to extend its operation. The review scope would be different between the two cases, though.

- System design concept
 - Work plan (with some information of PI team's roles and expected contributions from the observatory)
 - Funding status
- Proposal document for Phase II

Proposal document³ should cover specific contents as below. More details than LoI are clearly required, but still some elements can be left unaddressed in case sufficient studies are not possible due to limited resources:

- Cover page
 - Project title
 - Names and affiliations of PI and (if any) major team members
 - Executive summary of the proposal
- Introduction
 - Background, motivation, strength, and uniqueness of the program
- Description of the instrument
 - System design
 - Specifications
 - Expected performances
 - Fitness to the telescope and infrastructure
- Challenges & risks, and mitigation strategies
 - Technical
 - Programmatic (in terms of resource and schedule)
- Already completed works (if any)
- Future work plan with timeline
 - Procurement and manufacturing
 - Integration and test
 - Operation
 - Funding and human resourcing
- Requested operation concept
 - Mode
 - Term
- Request of resources from the observatory
- References
- Appendix

³ Whether or not a page number limit should be applied is TBD.