

SOAR Restricted Use Instruments and Visitor Instruments

SOAR is a 4.1 m optical/IR telescope located at an excellent site in the Chilean Andes which provides many clear nights of quality seeing each year. SOAR is a cooperative project between the Brazilian and US astronomical communities including dedicated partnerships with the University of North Carolina and Michigan State University. Chile, as the host country for SOAR, receives 10% of the observing time.

SOAR is a research institution seeking to expand and facilitate astrophysical research and discovery among its partner communities. As such, SOAR will entertain proposals for visitor or “restricted use” instruments (RUI) to be brought to its focal plane which show promise for unique scientific and/or technical advancement.

Restricted Use and Visitor Instrument Definition:

The SOAR partnership agreement defines two classes of instruments. The first is “consortium instruments” which are traditionally known as facility class. These have broad science support in the partnership and explicit board approval. These instruments are maintained by SOAR observatory support personnel and are open to use by all members of the partnership.

The second class of instrument is called “restricted use”. It is defined as follows in the SOAR consortium agreement:

“The restricted use instruments are those brought to the telescope and owned and maintained by members or by individual scientists and/or their research groups. These instruments will not be available for community use unless special arrangements are made between NOAO, the Board, and the relevant member.”

Within the context of RUI's, small “visitor instruments” will be distinguished from larger instruments. Each of these two sub-classes is briefly described below.

---Visitor Instruments:

An example of a visitor instrument would be a simple high speed CCD camera which could be mounted to existing telescope interfaces essentially without modification. This would include using existing power and Internet connections. The SAC believes visitor instruments should be judged on their scientific merit through the relevant partner's existing telescope allocation process. The resulting time allocations would then need to pass judgment by the SOAR director and the visiting instrument, if successful, would be brought for an observing run fully supported by its team. This implies a basic level of support from SOAR mountain and technical staff to receive the instrument, mount it on the telescope, and provide basic connections.

It is expected such visitor instruments would have observing runs of a few nights to a week, similar to other classically scheduled runs. If a visitor instrument were to be scheduled for an extended period of time, and/or be made available to investigators outside the visitor instrument group, then it would need to adhere to the RUI policies described herein. It is suggested that interested parties contact the SOAR director before submitting a visitor instrument proposal to gauge its feasibility. Visitor instruments will always be subject to constraints imposed by normal schedule and operations considerations as determined by the SOAR Director. Such visitor instruments will be limited to a maximum of two per semester to minimize the impact on SOAR operations; except that in exceptional cases, or when the impact on SOAR is truly minimal, the Director may choose to accommodate more such instruments.

---Restricted Use Instruments:

This is a large instrument that requires operation on one of the normal SOAR facility instrument ports. Any instrument which needs a facility port is automatically considered a RUI. The complexity of the instrument interface and required operational support may be more important factors than sheer instrument size in differentiating between this class and a visitor instrument.

Because facility instruments are routinely used throughout the partnership, they will have schedule and resource priority over RUIs where there is a conflict. It is expected that most RUIs will be mounted on one of the Nasmyth straight-through ports (see below) because these will minimize operational burdens.

Available Instrument Ports:

SOAR is equipped with three bent Cassegrain ports and two Nasmyth platforms. Each of the latter includes an instrument selector box (ISB) with three instrument ports (which have differences in guide fields, back focal distances, etc). A distinction is made for the “straight-through port” on each ISB. These are easier to access and have higher weight capacity than the other ports. Because of these factors, it is expected that these two ports will be the primary RUI ports. An additional port on the ISBs is reserved for a facility calibration unit. The fifth and final port on the ISB can be used for certain light instruments, but it has no guiding capability. One bent Cassegrain port is dedicated to the high resolution wavefront sensor and acquisition camera.

It is expected that the complement of facility instruments at any given time will nearly fill the available facility instrument ports. Groups interested in bringing an RUI or visitor instrument should consult the SOAR web pages for the current status of the SOAR instrument complement. Detailed questions can be directed to SOAR staff and partner institutions (see the contact information on the SOAR web pages).

Certain instruments or capabilities may provide multiple ports “multiplexed” from a single SOAR port. An example is the SAM ground layer AO module. Apart from its own dedicated CCD imager, SAM provides a second port which can handle light instruments.

RUI or visitor instruments can be mounted on this port and will be subject to the same guidelines as similar instruments going to any other SOAR instrument port as laid out in this document.

Restricted Use Instruments in the Partner Context:

SOAR is a partnership between diverse astronomical communities with different areas of scientific and technical interest. To the greatest extent possible, the partners should be given as free a reign as possible to explore new avenues of scientific and technical development through RUIs.

To the extent that an RUI does not impact the observing capabilities of the SOAR telescope or partnership, partners should be free to bring RUIs to SOAR within the context and principles set forth in this document.

It is expected that RUI teams will first gain input and support from within their own community.

The actual RUI proposal must then be officially sponsored by a SOAR Partner (or partners). This will be established by a unanimous vote of the SOAR Board membership of the sponsoring partner(s). All telescope time, including engineering/technical time for installation and test of the RUI (and redeployment of any facility instrument removed for the RUI), as well as for science observations, will be charged to the time share of the sponsoring partner(s).

Under the terms of the SOAR consortium agreement the cost of support of an RUI rests with the sponsoring partner. SOAR will provide telescope operators, and daytime technical support by the CP based SOAR operations staff, during installation, test and use of the instrument at the same level as would normally be provided to the partner when using the telescope. Any additional costs will be born by the sponsoring partner. These include, but are not limited to:

- all costs associated with shipping the instrument to/from SOAR, including insurance if required by the sponsoring partner.
- all non-labor costs, and costs for labor above and beyond that which can be provided by the Cerro Pachon based SOAR operations staff, on a time available basis, for: modifications to the telescope or its hardware/electronics and software to accommodate the instrument and integrate it into the SOAR control/software environment (to the extent required); installation and removal from the telescope; routine operational support; maintenance and repair (at the sponsoring partners discretion)
- costs of utilities, cryogenics and other consumables if in excess of regular operational levels.

Scientific Considerations:

An RUI represents a significant investment by the instrument team and also by the SOAR telescope partners and staff. As such, it is expected that RUI teams will submit a formal proposal to SOAR for consideration. This proposal should be sufficiently detailed to justify the undertaking by the RUI team and SOAR.

The proposal will be reviewed by the SOAR scientific advisory committee (SAC) who will then report to the SOAR board and Director with a summary of the instrument capabilities, resource needs, and overall impact on SOAR scientific operations. The intent is to provide independent advice to the board and proposing team to ensure the most efficient use of SOAR resources. It is recognized that the partners have the explicit right to use their observing time as they deem appropriate, but the decision to deploy an RUI on the telescope will impact the whole partnership through resource use (and additional resource requirements) at the telescope and potentially restricted use of existing facility instruments which would be removed from the telescope while an RUI occupies a particular instrument port.

Because there is potential for serious disruption of normal operations at SOAR if too many RUIs are attempted in a short space of time, the number of such instrument deployments will be limited to one RUI per semester with a maximum of two installation cycles per semester of that same RUI and weighted by partner share over time. The SOAR board and Director will use the SAC input on the RUI proposal to reach a final decision.

The proposal should include (but is not limited to):

A brief scientific and/or technical justification for the proposed RUI. Some partners may wish to emphasize technical development and training in their community over pure scientific investigation. While partners are free to pursue their own scientific and technical aspirations, the SAC can provide useful feedback to the team and the Board including gathering and synthesizing input from the remainder of the partnership which might wish to make use of the proposed RUI (although there is no obligation to make the RUI available to the other partners).

RUIs are not facility instruments and are not intended to be mounted indefinitely. The proposal should contain a detailed estimate of the number of observing nights needed to complete the associated science or technical goals. It should include detailed signal to noise requirements and estimates, sample sizes, and calibrations needed to accurately estimate the time to completion of the project goals. The proposal should account for the range of observing conditions to be expected during the RUI observation period.

For science based proposals, it should be clear that the RUI provides new and unique capabilities not available in the partnership which allow for new science to be done. If the

RUI competes with an existing capability, does it offer significantly improved performance? This should be justified quantitatively.

The RUI team should explicitly demonstrate that their team has sufficient resources and ability to properly obtain, reduce, analyze, and publish the data taken with the RUI.

The proposal must include a detailed schedule for all phases of the project, most importantly a window within which the instrument delivery may be expected. The SOAR partners and the proposers must understand that other new instruments may take priority over an RUI if delays are significant, and that the scientific opportunities offered by the RUI may diminish. All parties must understand that if a delay exceeds a to-be-determined period, there is no guarantee that the instrument would be mounted, or not, at least, for the periods anticipated in the proposal.

The RUI builders and the SOAR partners must agree to limitations on liability for all parties. SOAR must be held blameless in the event of damage to the RUI under any circumstances, and SOAR must hold the RUI builders blameless to any damage to the telescope or observatory facilities.

A major consideration will be impact of the RUI on SOAR operations. The proposal should outline the resources needed from SOAR to successfully deploy and operate the instrument. This will include a designation of the instrument port and needed interfaces (mechanical, electrical, cooling, software, etc) to the RUI.

Proposers should submit proposals for RUIs well in advance of the expected observing period envisioned for their program. A minimum of six months is expected to be able to prepare for deployment. Proposals will be accepted at any time and a decision will be made by the SOAR board in advance of the closest possible TAC deadline which allows for sufficient planning by SOAR.

Review:

After receiving the written proposal for an RUI, the SAC will review it. Input will be requested from the Director and SOAR staff to help assess the resources needed from SOAR so that the impact to on-going science operations can be weighed.

The SAC will also consider the following in assessing the proposal:

- How does the RUI effort fit with the current level of instrument development and commissioning activity at SOAR?
- Added value to SOAR. For example will the RUI provide a guider or instrument rotator which could be used by future RUIs?
- Does the proposal include provision for proper handling and transport of the RUI. Will SOAR staff be able to safely handle, install, and

maintain the instrument?

-Does the RUI deployment mean an existing capability will be lost temporarily to the partnership? The balance of capability with and without the RUI in the instrument suite will be assessed. Facility instruments with strong partner allocations will take priority over scheduling RUIs. The SAC will weigh the relative harm to a facility instrument science program by considering the total number of nights that instrument is scheduled compared to the number of nights needed for the RUI to complete its program.

Single vs. Two-stage Proposals:

If desired, the proposal described above can be split into two stages: (1) a preliminary proposal or letter of intent, requesting the SOAR Partnership to accept (through a Board Motion) the general concept for the RUI instrument; and (2) a final proposal that would be the request for the Board's final acceptance of the design of the instrument, of the plans for operating it, and of the definition of who is legally responsible for the added costs. If this two-stage procedure is followed, the Board Motion for accepting the Stage 1 proposal should specify what the Board is and is not agreeing to at that point, as opposed to what will be left for the Stage 2 proposal.

Extension of the RUI to Facility Class:

It may be that certain RUI teams will generate enough interest in the partnership to migrate the instrument to long term or facility class. The SAC recognizes this may be advantageous to the RUI team and the SOAR partners. This policy only considers instruments of short term, restricted use within the partnership. Facility instruments are covered by other SOAR board resolutions.