

# Report of the User's Committee for NOIRLab 2024

Report from the November 21-22, 2024 Meeting of the NOIRLab

**Membership:** Ian Dell'Antonio (Brown University; Chair), Matthew Holman (Harvard-Smithsonian Center for Astrophysics), Danny Milisavljevic (Purdue University), Claire Poppett (Space Sciences Laboratory, UC Berkeley), Thomas Puzia (Pontificia Universidad Católica de Chile), Javier Sanchez (Space Telescope Science Institute), Angelle Tanner (Mississippi State University), Harry Teplitz (Caltech/IPAC), Jonelle Walsh (Texas A&M University)



## Introduction

The NOIRLab user's committee held its inaugural in-person meeting at NOIRLab, in partial fulfillment of its charge:

“The Users Committee for NSF's NOIRLab (UCN) is established to provide advice to the NOIRLab Director on how to enhance the user's experience across all of the relevant NOIRLab operations (telescopes, data archives, software, science platforms, and other tools). The Committee will identify areas of improvement for the users, and provide specific recommendations. They will base their work on their experience, the input from individual NOIRLab users and advisory groups, and the feedback from the community at large through the appropriate channels. The advisory is science-driven and community-wide. NOIRLab will inform the Committee on operations as required.”

Over the course of two days, we heard presentations on the structure of NOIRLab, the TAC system, the development of tools and processes to enable time-domain investigations, the reports from the user's committees of the constituent parts of NOIRLab, and a set of presentations on the structure and future plans for the data archives. We organize our report around the schedule of presentations that is available at (<https://noirlab.edu/science/about/governance/user-committees/ucn/meetings>), with committee impressions of the presentations and activities of NOIRLab and their impact on the user

community, accompanied by recommendations the committee is making to improve the experience of NOIRLab users.

## **Section 1: The Organization of NOIRLab**

The committee appreciated that the strong commitment to serve a wide community of scientists was included in the NOIRLab mission statement. Clear expressions and adherence to these core values are always important. NOIRLab's user base is geographically diverse, and that distribution is an important metric of the mandate to provide access to the full community.

## **Section 2: NOIRLab's TAC Process**

The TAC process is time-constrained, and the team is lean, but it has functioned smoothly with the introduction of the new database/tracking system, and twice-yearly calls is still a functioning model. Significant progress has been made in mitigating unconscious bias in the process. Going forward, the TAC is faced with increasing questions about supporting time domain follow-up observations.

In the area of time domain, the TAC has had discussions about the prospect of rebalancing the proportion of the time allocated to Surveys vs. Individual observer programs; but not yet about the balance between ToO and "static" science allocations. In addition, NOIRLab has made great strides in developing tools (DRAGONS, ANTARES, AEON & GOATS) that will make it easier for users to make use of facilities for LSST alert followup.

*Recommendation: It would be useful to have more information on completion rates for allocated telescope programs. The UCN discussed that it may be necessary to have a clearer policy on resolution of programs that are lost to observatory issues (rather than user or weather, for classically scheduled programs).*

The UCN commends NOIRLab for adoption of Dual Anonymous Peer Review (DAPR) in the TAC process to ensure merit-based decisions. It would be helpful to have metrics for the success of this process in meeting the goal. It is not easy, because NOIRLab is prohibited from requiring that proposers disclose personal information, but it is allowed to ask for voluntary information.

STScI has faced similar issues in evaluating DAPR, and they may have helpful advice on how to approach this evaluation. Currently, the requirement for returning science-ready data only extends to NOIRLab survey proposals and Gemini Large and Long programs. With the understanding that some small programs might have very specialized settings, the committee suggested that the TAC consider whether adding a question on the archival value of the data (and its possible involvement in outreach or undergraduate research) might be appropriate, in addition to asking about the proprietary period of the raw data.

*Recommendation: Another measurable metric is the success of first time proposers, and this*

*should be tracked.*

### **Section 3: Time-Domain Follow-up Tools and Coordination**

Time domain astronomy (TDA) is seeing remarkable advances in ability to monitor the dynamic sky, and in turn tremendous growth in users and targets that need access to NOIRLab facilities for follow up and characterization. The advent of the Rubin Observatory and its Legacy Survey of Space and Time (LSST) will increase the discovery space by an order of magnitude, and will likely bring added demand for access to NOIRLab facilities. In addition, the rise of multi-messenger astronomy (MMA) increases the demand for near-simultaneous followup of gravitational wave and/or neutrino events. NOIRLab is taking steps to handle the unique workflows of TDA that include rapid and coordinated triggers of facilities, and prepare for the new era of LSST-enabled science where transients will be identified and promptly reported in alert streams (real-time alert latency between exposure and distribution of alert  $\approx$  60 seconds; approximately 10 million per night).

ANTARES is a platform designed by NOIRLab to process events at LSST scale. ANTARES will play an important role in providing public access to Rubin alerts. This, in turn, will bring the time domain to every astronomer and even the general public.

The time domain community consistently identifies coordination of follow-up as a challenge, and NOIRLab is taking steps to help users to efficiently access and trigger NOIRLab facilities. NOIRLab has built/deployed many elements of an automated, end-to-end platform for time-domain follow-up of Rubin LSST. They are motivated to help users focus on science, rather than the process of obtaining the followup. The Astronomical Event Observatory Network (AEON) is a network of programmatically accessible, dynamically scheduled telescopes capable of rapid response to MMA/TDA alerts.

The GOATS (the Gemini Observation and Analysis of Transients System) is an example of a system that provides direct integration of Target Observation Monitors (TOMs), which will enable end-to-end rapid and efficient management of TDA sciences, from identifying targets, to triggering observations, and processing data.

*Recommendation: The large scale of Rubin (inclusive of LSST data products and all related NOIRLab facilities that will participate in follow up science) will demand that more people are available for further development and maintenance of NOIRLab services, especially ANTARES.*

The team developing and maintaining software for NOIRLab users and cyberinfrastructure supporting Rubin operations group is small and there is concern about the ability to maintain robust services as TDA scales into the future.

#### **Section 4: Reports from the Users' Committees:**

NOIRLab currently has four user groups, although only three meet regularly. The user groups are: Rubin Users committee (UCR), Mid-Scale Observatories Users Committee (UCM), Gemini Users Committee (UCG), and Data Science Advisory Group (DSAG). Each committee aims to have a diverse membership with broad expertise. The UCR and UCM meet twice per year and the UCG meets once per year. Sometimes these meetings are standalone and are not integrated with other project meetings, for example, the UCR does not meet during a Rubin collaboration meeting, while the UCG meetings overlap with the Gemini operations working group. The aim of each user committee is to provide feedback to the observatories from the users. The users communicate with the committees through surveys, direct email, and informal conversations, as well as AAS town halls and splinter sessions. UCM is the most broad committee and aims to provide feedback to NOIRLab Mid-Scale Observatories on all areas of operations that affect users of KPNO, SOAR, WIYN and CTIO. UCR and UCG submit a report after each meeting and any recommendations are met with a formal response. The UCM may want to consider writing a report after each meeting in line with the other user committees. Access to the reports will help this committee in making recommendations that affect users across all NOIRLab facilities.

The committee sees value in the listening session that the UCR has implemented as part of their meetings. The listening session is advertised to the community ahead of time, involves users remotely logging into the meeting for a brief period, and raising issues for later discussion by the UCR. The committee also appreciates that these listening sessions allow for feedback to be anonymous if desired. The UCG and UCM may want to consider incorporating such a component into their meetings as a way for the community to provide feedback.

#### **Recommendations:**

*The committee notes that the UCM does not currently have a chair and recommends that one be appointed.*

*There have been no recent meetings of the DSAG (the last email correspondence was in July 2023). The committee finds the lack of meetings concerning given the importance of software and archival resources to science productivity. The committee recommends that DSAG activities resume, and a chair be appointed for the DSAG.*

#### **Section 5: NOIRLab Data Archives and community resources**

There were two presentations related to this topic which covered NOIRLab data archives and plans for future coordination and the Astro DataLab and SPARCL. From this we find that the size and usage of the Data Archives and the functionality available in DataLab are impressive, and should be publicized more widely. Data archive usage is driven by the availability of reduced data which is currently not being hosted for some of the facilities including Gemini.

*Recommendation: Given the significant fraction of papers that are based on archival data, additional resources devoted to automated data reduction could increase the return on investment for existing observations. Additional community-provided high level science products would also greatly benefit the archival users.*

*Recommendation: Datalab should aim to lower the barrier to entry for new users. For example, a gallery of current notebooks would help users navigate DataLab more easily. Introducing a sky viewer application similar to those on the ESO and ESA archive would help users more easily navigate through data products with object-based queries.*

About 25% of publications are already coming from archival data, and this is likely to rise. Archive-based publications lead GS/GN/Mayall/SOAR/WIYN-based papers, only behind Blanco(DECAM)-based papers. The added functionality of Spectra-based investigations with SPARCL are exciting to see and will only get more important as more spectroscopic data becomes available to the full NOIRLab community.

The archive and data management teams are very lean, and new developments for users are limited by person-power and money to fund these developments. HLS products for some of the telescope/instruments (mostly DECAM and NEWFIRM) that are produced and stored in the science archive (and transferred to DataLab periodically) are managed by one person on one architecture without redundancy. This is high risk. FTE and structural requirements for mitigating this situation are known but are not being implemented.

The separation between archives presents a challenge in avoiding duplication of effort.

*Recommendation: With very small teams, more coordination could significantly increase how much gets done. Similarly, users would benefit from a more unified experience, with clear links between services and minimal duplication of entry points (single sign on, etc). As Rubin moves into operations, it would be very beneficial to leverage work already done there on the archive user experience.*

### **Plans and Activities for 2025:**

The committee discussed plans for an additional online meeting mid-year to discuss updates and plan the agenda for the 2025 Committee meeting. We also discussed plans for a community survey in 2025 to fulfill the other half of the committee charge in advance of the 2025 User's committee meeting.