Published on *SOAR* (https://www.ctio.noirlab.edu/soar)

SOAR Remote Observer's Guide

Rev. March 26, 2021

UPDATE - As of Oct 7, 2020 SOAR resumed science operations. However, ALL OBSERVATIONS WILL BE CARRIED OUT REMOTELY OR IN AEON QUEUE MODE, until further notice. Therefore **we strongly encourage users to thoroughly read this remote observing guide**. We will provide sufficient training for first-time observers to work remotely. If you have any questions, please contact your support astronomer or the Director's office. ALL instruments are supported. We are following a plan that ensures staff safety while still enabling science; this does limit our flexibility. **Please read this memo for a summary of restrictions.** [1]

With sufficient advance notice, it may be possible to convert scheduled nights into AEON queue nights, which could facilitate acquiring the data needed. Consult the **AEON home page** [2] and listed contacts to see whether this option is appropriate.

SOAR actively encourages remote observing for any proposals requesting time with the facility instruments (SOI, SAMI, SIFS, TripleSpec 4.1, Spartan, and the Goodman Spectrograph). The requirements to qualify for remote observing are:

a. The person who will carry out the observations has previously observed at SOAR using the instrument(s) requested in the proposal, either as on-site SOAR Visiting Astronomer, or as an experienced remote observer (recommended, but waived during pandemic, see above).
b. Our review of the proposal does not reveal any special technical requirements which would make it preferable to have an observer on-site.

You should have an efficient and reliable remote observing set-up (see recommendations below). **IMPORTANT!** All remote observers, like on-site observers, must follow the NOIRLab Cybersecurity and Acceptable Use Policy [3]. (For typical remote observers, compliance with the policy just involves basic common sense, like not posting computer IPs and passwords in public locations.)
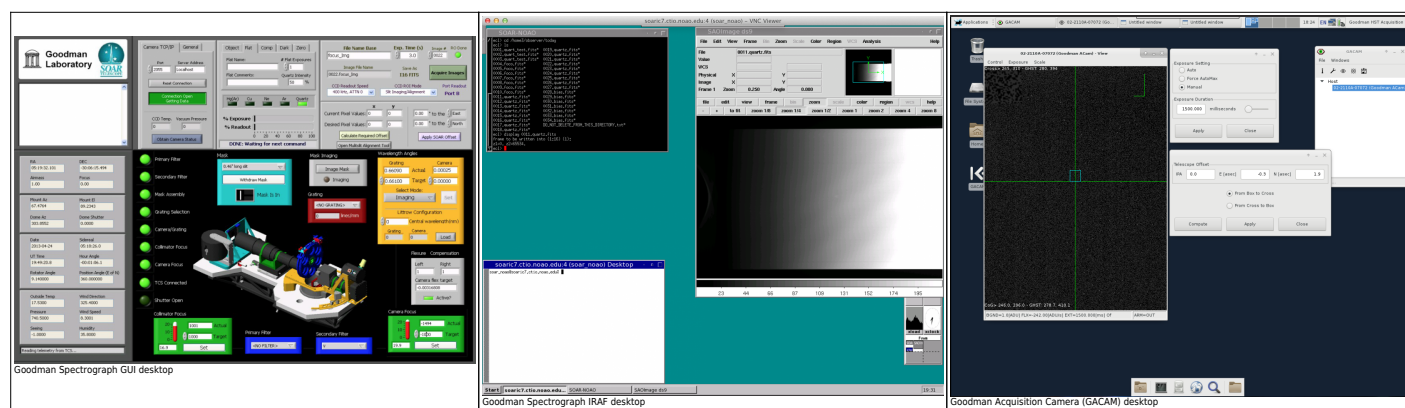
How is remote observing done at SOAR?
Remote observing is done by connecting via VNC to various computers at SOAR/CTIO and opening a

remote display of the desktop on which the instrument GUI is running, another remote display with the desktop of the computer on which you run IRAF, and likely a third one for use of capabilities such as the Go. An additional connection will be your videoconference link with the Telescope Operators and your [Support Scientist.](#) [4] This can be Zoom (the preferred method), Skype, or Polycom if you have the required hardware at your institution.
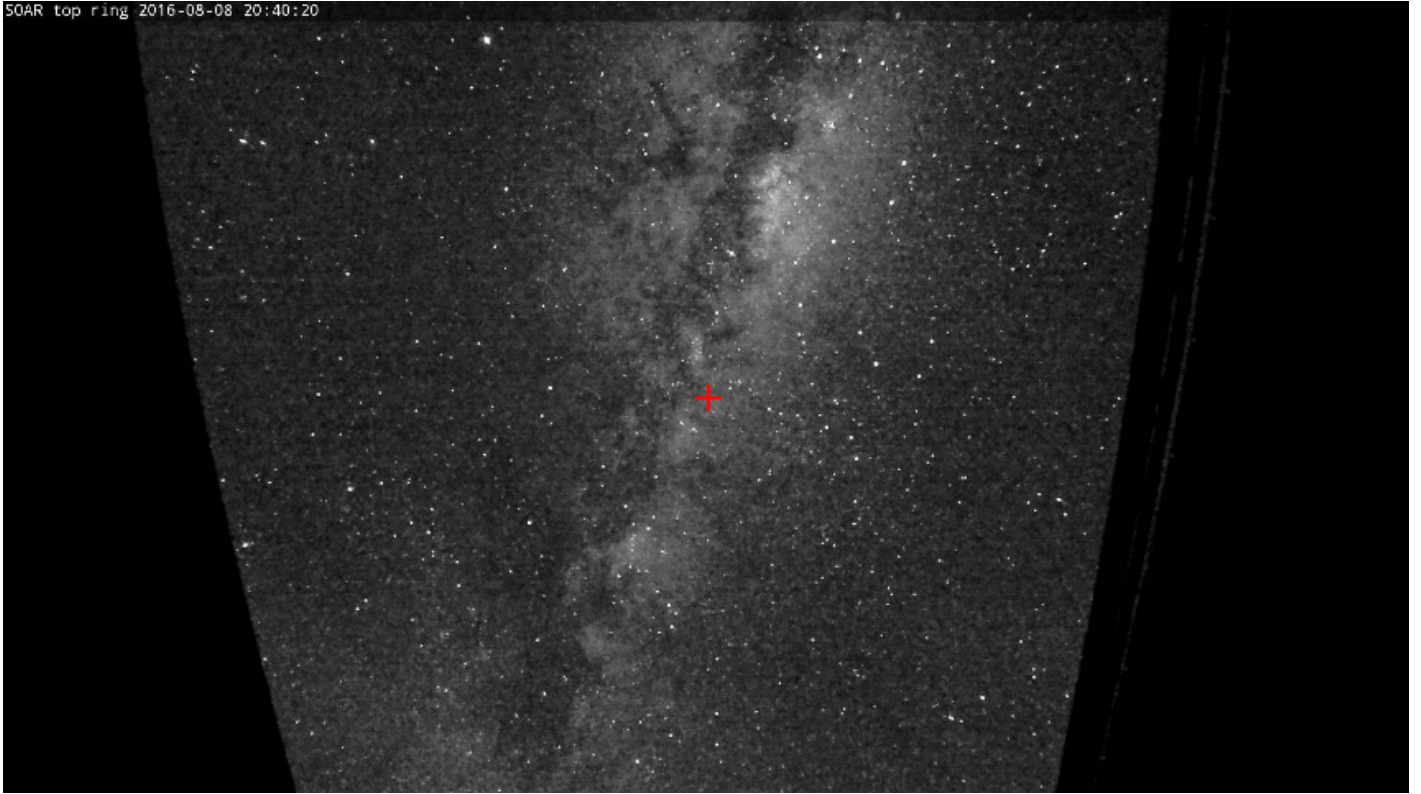
Requirements for remote observing with SOAR:
1) You need a fast internet connection, and at least 2, preferably 3 monitors (at least 2 should be large enough to support HD resolution). This means that you will probably use your desktop, or your laptop connected to an additional 1 or 2 monitors. The multiple monitor requirement is needed because you will be displaying **at least** two desktops, **but more likely 3,** such as in the example for the Goodman spectrograph shown below, in which 3 VNC connections are used: on the left, the instrument Graphical User Interface (GUI) on the Goodman instrument computer, in the middle, an IRAF session on the appropriate SOAR machine, to do your basic image display and quality control, and on the right, the Goodman Acquisition Camera GUI, that allows you to visualize and center your target on-slit. Moreover, you will also likely want to keep a look on the sky conditions, using the [SOAR top ring camera](#) [5](you need to be connected to the VPN to access the video feed), [5] that looks to the sky through the dome slit (see sample image below). This is done in your browser, but you will certainly want to have some screen space for this too.

These requirements mean that *attempting to do remote observing with nothing but your laptop (or a single-monitor computer) is strongly discouraged* since it will impact negatively your observing efficiency by requiring multiple switching from one VNC session to the other.

Goodman Spectrograph GUI desktop

Goodman Spectrograph IRAF desktop

Goodman Acquisition Camera (GACAM) desktop

View of the the Milky Way through the SOAR top-ring, sky-viewing camera. The black areas on either side are the edges of the SOAR dome.

2) A Cisco VPN client or alternative.

Linux systems: you will need *vpnc*, which is the Cisco-compatible client. If you are on a Debian-based Linux installation, like Ubuntu, you can use the following commands from the terminal (as su):
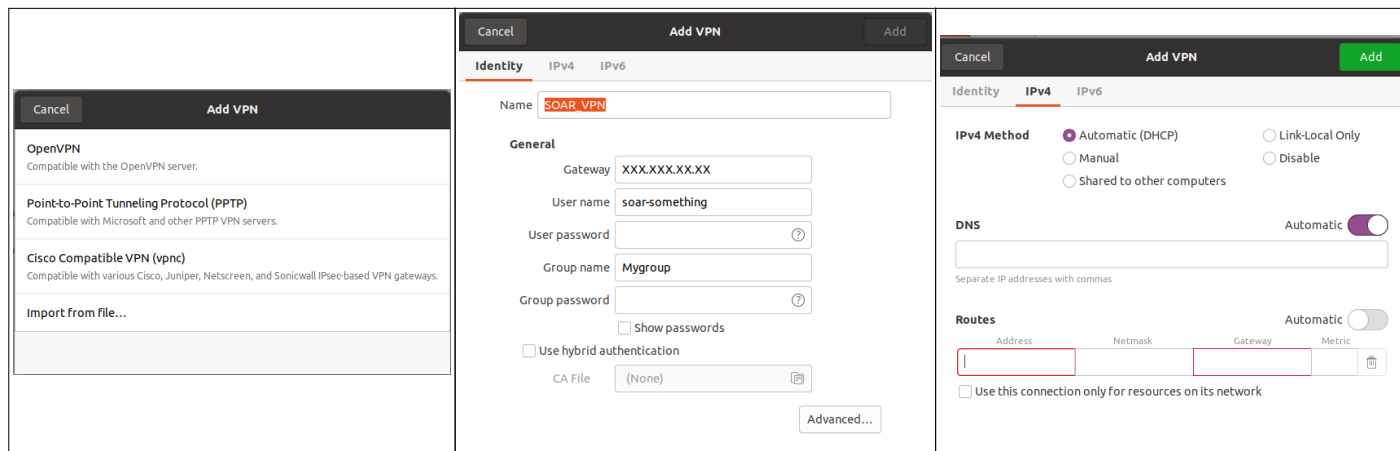
          sudo apt-get install network-manager-vpnc
          sudo apt-get install network-manager-vpnc-gnome

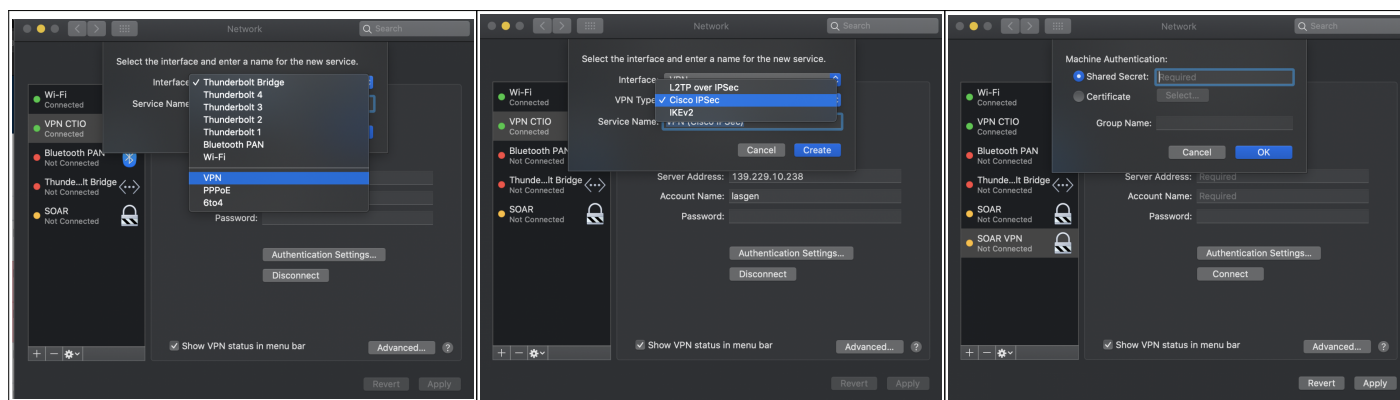If you use a RedHat-based OS, Like Fedora or CentOS, then the commands will be:

           yum -y install vpnc

Some documentation can be found here: https://wiki.centos.org/HowTos/vpnc [6]

An example of how the configuration looks in Ubuntu is shown in the following screenshots

MacOS: Mac users can use the Cisco-compatible VPN native client that comes by default with Mac OSX.

Windows 7 64 bit and Windows 10 64 bit: we recommend the VPN client from [ShrewSoft](#) [7]. This client allows for configuration of the group parameters, which is required to connect to the SOAR VPN. Details on how to configure the ShrewSoft VPN client can be found at [this link.](#) [8] (Cisco AnyConnect is not recommended and generally will not work correctly.)

Once you have a working VPN for your system, you can connect using the SOAR VPN, with the credentials that will be provided by your [Support Scientist](#) [4] (see below).   Always use the actual IP number to set up the VPN.
NOTE for UNC AND MSU observers: both universities have a limit of up to 9 VPN connections each.

3) A VNC viewer. For GNU/Linux and Mac OSX machines we suggest the *Real VNC Viewer* client. We have tested RealVNC to work fine with Ubuntu 16, 18, and 20, and the latest macOS, Catalina 10.15.6. For Windows machines, we suggest either the *Real VNC Viewer* client or the *Ultra VNC Viewer* client. We also know that *Vinagre* and *vncviewer* on GNU/Linux work fine. Contact a support astronomer for details.

NOTE on VNC connections: we ask observers to bear in mind that though our system can handle multiple VNC connections, when teams of observers have many people all trying to have multiple VNCs running, there may be lag in the communications. For example, observing with Goodman normally

requires 3 VNC windows: one running on the Goodman computer for the spectrograph GUI, one for image analysis with IRAF on a separate Linux computer, another for the acquisition camera (on a differente computer as the two previous ones). Our operators already run VNC connections to each of the above, so they can be on-track on the progress of the observations, and therefore interact better with the remote observers. Therefore, at the very least there will be 2 VNC sessions connected to each of the above computers.

4) Audio/video conferencing connection: Zoom is now the preferred method of communication. Your Support Scientist [4]
will provide you with the appropriate link. An alternative is using Skype. SOAR has a dedicated Skype account in the Console Room (soar_pachon). Again, contact your Support Scientist [4] for details.
We also have a working Polycom at the telescope and our La Serena remote observing room. If your institution has a Polycom at your remote observing room, then you can use this as your video conference method. However, interactions with support staff or collaborators without a Polycom become more complicated. Contact a support astronomer or the operator beforehand so that you can test the connections.

After all of the necessary software is downloaded, please contact your **Scientific Support Staff** [4] so that VPN and VNC credentials can be sent to you securely.

Before your remote observing run

1. Please plan ahead and **contact your Scientific Support Staff [4] a least 4 weeks before your scheduled remote observing**. This allows us time to test the VPN, VNC, and VoIP connections, and also to discuss with you your particular instrumentation needs, or whether your program plan has special requirements that need to be taken into account. Please remember, any failure of the VPN/VNC clients or lost connectivity to SOAR during an observing night should be treated the same as a systems failure or weather problem. *SOAR does not provide service observing.* However, AEON queue-mode observing is now available for users that may want to manage their program through this new, highly automated, programmatically accesible dynamic queue. See the AEON page [2]for more details.

i) If your time was allocated through NOIRLab or the Chilean TAC, your contacts are the following:

- **Goodman** [9]: Sean Points, Regis Cartier or Alfredo Zenteno
- **SOI** [10]: Sean Points
- **SAM** [11]: Andrei Tokovinin or Cesar Briceño
- **SPARTAN** [12]: Jay Elias
- **TripleSpec 4.1 [13]**: Sean Points
- **HRCam [14]**: Andrei Tokovinin

ii) If your time was allocated through the Brazilian TAC, then your Support Scientist for any of the SOAR instruments is an LNA staff member (soar.suporte@lna.br [15]).

iii) If you are observing through time allocated by the University of Carolina at Chapel Hill (UNC) or by Michigan State University (MSU), the person in charge of SOAR at your department will provide you with the appropriate support.

2. Submit your [Instrument Setup Form](#) [16] at least 2 weeks before your observing run.
3. Depending on the instrument and type of observations you will also need to submit special, critical information well in advance:
    i. If you will be observing ***with SAM you need to submit your target list at least 2 weeks before your scheduled observations,*** so that we can submit to the US Laser Clearing House the request for authorized time windows in which each object can be observed with the SOAR Laser Guided Adaptive Optics System
    ii. If you will be observing ***with the Goodman Multi-Slit Object (MOS) mode, you need to submit your mask configurations with at least 1 month ahead of your scheduled observations***.

During your observing run

On your first day, make sure to contact your Support Scientist and the Telescope Operator early on, so you can arrange with them the appropriate time to start your afternoon calibrations, and whether you need twilight observations.

Afternoon calibrations start at 4pm. In special cases, e.g. if very long calibrations are required, an earlier start may be arranged, but this requires special arrangements. Ask your [Support Scientist](#) [4].

Remember to fill in your **End-of-Night report** [17] before going to bed. **This is very important**, not only because it allows us to keep statistics on telescope use, downtime due to weather or technical issues, but mostly because only if we receive an early report on a technical problem, can we act promptly the next day to try and fix it and have you or the next observer ready for the next science night. Please note that you need to connect through the VPN in order to access the Night Reports.

After your Observing Run.

Please fill in the **End-of-Run report** which can be found on our web site, at **this link.** [18] The End-of-Run form is our way to know your assessment of the entire observing run experience, so it is very important you submit it. Feel free to add any comments you think appropriate. Also, please note you will need to connect through the VPN in order to access the End-of-Run Reports.

Source URL: https://www.ctio.noirlab.edu/soar/content/soar-remote-observers-guide

Links
[1] https://www.ctio.noirlab.edu/soar/sites/default/files/Observing%20restrictions.pdf
[2] https://www.ctio.noirlab.edu/soar/content/soar-aeon-home-page
[3] http://www.noao.edu/cis/policy/
[4] https://www.ctio.noirlab.edu/soar/content/soar-staff
[5] http://139.229.15.155:1217/
[6] https://wiki.centos.org/HowTos/vpnc
[7] https://www.shrew.net/download
[8] http://superuser.com/questions/312947/how-to-configure-shrewsoft-vpn-to-connect-to-cisco-vpn-server
[9] https://www.ctio.noirlab.edu/soar/content/goodman-high-throughput-spectrograph
[10] https://www.ctio.noirlab.edu/soar/content/soar-optical-imager-soi
[11] https://www.ctio.noirlab.edu/soar/content/soar-adaptive-optics-module-sam
[12] https://www.ctio.noirlab.edu/soar/content/spartan-near-ir-camera
[13] https://www.ctio.noirlab.edu/soar/content/triplespec-41
[14] https://www.ctio.noirlab.edu/soar/content/access-visitor-instruments
[15] mailto:soar.suporte@lna.br
[16] http://www.ctio.noao.edu/SOAR/Forms/INST/setup.php
[17] http://www.ctio.noao.edu/SOAR/Forms/EON/Form.php?telescope=SOAR

[18] https://www.ctio.noirlab.edu/soar/content/instrument-setup-forms-and-observing-reports