

SARA 20m Radio Telescope Account Guidelines (August 26, 2018)

These guidelines provide details on the administration of the 20m radio telescope account at GBO. This is a living document as will be updated as needed. Readers are requested to send all comments and suggestions to the SARA 20m Administrator.

1. Purpose

The 20m account is intended for SARA educational activity and STEM support activity. It is not a member benefit, although members can express a desire to participate in its use.

2. The SARA 20m Administrator

The permanent account is obtained through GBO. The SARA Board of Directors approve and monitor the funding of the account and assigns an Administrator to oversee the functioning of the program. In 2018, the GBO POC is Sue Ann Heatherly, and the SARA 20m Operations Administrator is Stephen Tzikas. The SARA Treasurer oversees the transfer of funding to GBO. The SARA 20m Administrator shall have the following duties to facilitate proper functioning of the 20m program:

- a. The Administrator shall keep a register of all users, who must request access and receive a password. The Administrator and user will agree on the user's initials (to avoid possible duplication).
- b. The Administrator shall inform all users of this instruction so that users can comply with GBO requirements and ensure the success of the program for all. Success and continued use of this program depend on users not abusing SARA funding of the 20m radio telescope. Guidelines to ensure this are found under "Users."
- c. The Administrator shall maintain this Guideline and post it under the SARA website headings for the Administrative tab (main page top ribbon), as well as the Sections tab (main page top ribbon) specifically under both the Analytical Section and the Outreach Section.
- d. The Administrator shall coordinate with all SARA members promoting STEM support activities on behalf of SARA, and any stakeholders cooperating on educational observation programs, such as the Cas A Observation Program.
- e. The Administrator shall state the reason of the user's interest in the 20m scope, i.e., student learning, amateur learning, creation of STEM support activities, etc. This allows SARA to better understand how the 20m radio telescope will be used.

f. The Administrator shall administer an appropriate amount of the paid credit observing time into the 20m credit balance (i.e., avoid a large balance at any one time to avoid observation abuse).

g. The Administrator shall change the 20m password on a regular basis, or designate that to another person who has access to a notification app.

3. Users

Since there is a cost for the use of the remote 20m radio telescope at GBO, participants are asked to observe the following rules under an honor system:

a. Participants will register with the SARA 20m Administrator and send a copy of their request to the SARA Treasurer for SARA membership confirmation. The request shall contain the mandatory language in section 4 of these guidelines as required by the NSF.

b. Participants will name their observation according to the object they are observing following by their initials as agreed with the Administrator.

c. While Participants can consult with the Administrator on 20m questions, the Administrator is not a technical contact. If a problem is encountered the participant is expected to research the issue either by reviewing the 20m Skynet manual or contacting the technical help for Skynet. The participant will inform the Administrator of the outcome so that a record can be placed in a SARA instruction, which supplements the 20m Skynet manual. The Administrator is a volunteer and should not be expected to research solutions to technical matters for others.

d. Participants are expected not to run observations that consume great amounts of time, such as raster scans that typically take 30 minutes time. Participants can ask about creating their own accounts for such expensive observations. However, if participants are willing to submit a professional quality submission to the SARA Journal, or agree to a conference paper and presentation, SARA will discuss the participant's request for additional scope time. SARA will evaluate their ability to deliver an article or presentation that can help educate others to observe and learn how to use a sophisticated radio telescope properly.

e. Development of advanced observational skills, that can be taught to less sophisticated observers, are of interest to SARA. If a user has an idea or wants to review a list of observation instructions that need to be developed and validated, contact the Administrator. SARA is interested in the creation of observational programs, that in cooperation with other stakeholders, help promote the science of radio astronomy observation, skills, and interest. Such endeavors could also be in the form of a student project for university credit, if the university professor is willing to work with SARA.

f. Participants have access to the 20m observational logs for all observations ever submitted to Skynet under any account. This allows participants to observe other raster scans and

observations similar to their observations. However, these observations vary greatly in quality according to the skills of those observers.

g. Participants will be informed on how password changes will be administered, such as through a smart phone like 'Whatsapp' to communicate. Password changes can be transmitted to the group quickly and securely.

4. NSF Security Requirements

Recently, the NSF has required GBO to begin adding language to telescope time sales contracts related to acceptable use of the NSF-owned telescopes and regulations regarding time sales to foreign nationals. SARA's existing EPO (guest) account predates and is not subject to these new considerations.

To comply with the new NSF requirements, GBO relies on self-certification of users for GBO instruments. GBO recommend a similar process for SARA. This could be accomplished by adding to the notification request email or letter to SARA granting its members access, language that, by accepting and using the password, the user certifies they are a US Citizen; will only observe non-man made, astronomical sources and objects; and will not provide telescope access to any other individual.

GBO believes SARA's self-compliance suggestion is a good vehicle to meet these needs: SARA will enforce by "practical intent" via use of two accounts: the permanent account (subject to SARA's purchase of observation credits) will require a user to acknowledge by email or in writing that they are a US Citizen (without document proof), and the SARA guest (GBO) account (with limited credit) will be used at SARA conferences and similar venues where participants and University students (via their Professors who are SARA members) have the opportunity to try the 20m without citizenship identification. If a person wants additional time, they must register with the permanent account and state they are a US citizen. They must also be a SARA member.

It is also recommended by SARA's 20m Administrator that SARA takes additional good management practices to limit its liability while it is still understanding NSF intentions and level of enforcement on the prohibited use of the 20m telescope by foreign nationals.

SARA believes that strict literal enforcement is impossible as many amateurs and students must be trusted to keep the password secure. Additionally, if SARA requests proof of citizen, that means keeping personal privacy information on file, which then becomes subject to Federal regulation and privacy protection laws (a legal burden). SARA will evaluate an additional step it will take for the foreseeable future to reduce the likelihood of foreign national use. Thus, SARA will also enforce by "practical intent" restricting use to members with US addresses (and who claim to be US citizens).

5. NSF Educational Requirements

The 20m radio telescope will not be used for research. Education and public outreach purposes includes challenging SARA members and students with more advanced learning opportunities, such as how to make more accurate target observations, do some of the mathematics behind the observations (such as learning to convert counts to flux), and comparing their results to published data and interpreting the meaning of those results.

For example, this could include working with others to establish a citizen science observation program for amateurs and students. That may require SARA to invest some time in learning how to take accurate observations so that the absolute flux values can be suitably calculated after removing background and instrument noise. As a guide, SARA is using Dr. Reichart's paper on the fading of Cas A as a guide to teach, which used the 20m and 40ft scopes at GBO.

All Educational activities with the 20m shall have the inclusion of the following GBO statement:

“The Green Bank Observatory is a facility of the National Science Foundation operated under cooperative agreement by Associated Universities, Inc.” on all user-internal, public, and educational presentations containing data obtained under this program.

Overseas presentations by SARA members should temper the expectations of the 20m program, as its use to these audiences will likely be unavailable. SARA has access to a 20m dish (with restrictions) but it is for educational purposes and can coordinate observations with radio dishes in other countries.

6. Dual Account Use

Additional credits in SARA's EPO guest account would be requested from Sue Ann by the 20m Account Administrator. This account will be used for demonstration purposes.

The SARA guest account will be used for introductory demo purposes where it doesn't need to keep track of registered users, especially as the SARA 20m Administrator may not attend all events, such as the Western US conference in the Spring. SARA has found that first time users of the guest account, after getting a SARA demonstration on it, go into the account and place some simple observations in the queue to get a feel for the process, without necessarily understanding very well what their results mean.

Marty Bloss is the Green Bank Program Manager for the SARA permanent account. The SARA permanent account has a rate of \$60 / hour for educational purposes. The guest account had 10,000 gratis observational seconds in it, as of August 2017. Sue Ann Heatherly is the POC to add specified credits to both accounts at SARA's request, with the appropriate coordination completed beforehand. Dr. Dan Reichart at UNC administers the optical telescope accounts for which SARA does not have an account nor will seek this.

7. SARA Internal Administration

The SARA Board of Directors appoints a 20m Administrator to oversee the 20m account and keep the BOD aware of issues. Applications to use the 20m scope (via the permanent account) will be sent to both the Administrator and the SARA Treasurer. The Administrator maintains the use and member log, and the Treasurer confirms SARA membership.

The Administrator will execute a planned pacing for the \$300 credit. It will be released in 1-hour increments, into the new account that was created. Sue Ann Heatherly will be asked to place 1 hour of credit into the new account. The Administrator will monitor the account and alert her when we need another 1 hour of credit. Since it is likely many people will use the account, SARA is will have a registered member/user list (free of charge), whereby users will name their observations ending in their initials. This will be under an honor system, because there is no other practical way to do this. However, the registration should help in making abuse of funds less likely by unregistered users. SARA also plans to have regular password changes, perhaps on a monthly basis. SARA will be experimenting to see what works best.

SARA envisions the SARA permanent account to be used by members and students who want a more in-depth understanding of what they are doing. Hence, SARA will be attempting to provide them with educational instructions on how to make more challenging observations, make them accurately, and understand what they do. SARA is still formulating how to define its STEM educational activities, so instructors and users understand their responsibilities. Proposals to adjust the guidelines will be sent to the 20m Administrator for review, and if necessary, for BOD approval.

SARA STEM Activities

SARA STEM educators who develop STEM observational programs for use with the 20m and 40ft radio telescopes, are requested to provide a copy of the procedures to the Administrator for posting on the SARA Analytical Section, until such a time that an interested and capable SARA member requests to be the official SARA STEM observation program developer and coordinator.

Demonstrations of the 20m radio telescopes are anticipated at:

- 1) The Summer SARA Conference by the 20m Administrator (Steve Tzikas), and
- 2) The Spring Western Conference by the SARA Western Conference Coordinator (Dave Westman)