

Report of the 23rd GTC User's Committee Meeting

March 11 – 12, 2022. Held remotely on Zoom.

GUC members:

Chair: Martín A Guerrero Roncel (IAA)

Vocals: Josefa Becerra González (IAC), Rana Ezzeddine (Uflorida), Mar Mezcua (ICE), Francisco Najarro de la Parra (CAB), Ismael Pérez Fournon (IAC), Alberto Rebassa Mansergas (UPC), Laurence Sabin (UNAM)

1. General Remarks

The 23rd GTC users committee (GUC) meeting was held remotely due to the pervasive health crisis. The GTC director and representatives of the science, engineering and development divisions reported to the GUC about the current status, performance and maintenance of the telescope, as well as the delays caused by the on going health crisis and plans for new developments. This document summarizes the most important issues presented and the topics discussed during the meeting, including the recommendations from the GUC.

Impact of the crisis

GTC Night operations were conducted remotely from the GTC headquarters at sea level from late April 2020 to September 2020. These were resumed on September 2020 with one GTC SA at the telescope following strictly safety COVID-19 protocols. Visits to GTC are still suspended and Visitor Astronomers are encouraged to use the Remote Visitor Observing mode. Notable improvements in this mode are ongoing.

Funding situation

The GTC Director is pleased to announce a MICINN funding increase to +1.375.000 € for operation and maintenance, thus providing sustainability to the GTC operations. The GTC 2021-2024 STRATEGIC PLAN has just been submitted to MICINN.

There are still no news about the new instrumentation funding to be provided by the Canary Islands Government. As a result, the launch of the process for new instrumentation is on hold, but it is expected to gain momentum during 2021.

Other news

Major integration work will take place during 2021 (preparation of the Cassegrain focus, maintenance of platform, MIRADAS, ...), with the important action of moving OSIRIS to the Cassegrain focus. This is expected to have a significant impact on the operations of GTC, but it is considered to be an important step to enlarge GTC capabilities in the future.

2.- GTC Director responses to GUC recommendations from the previous meeting

GTC acknowledges the GUC recommendation to minimize the OSIRIS stand-down during its migration to the Cassegrain focus and endorses its commitment to shorten the transition as much as possible.

As with respect to the GUC recommendation to have available high-dispersion spectroscopic instrumentation, it is noted that the PDR of GTC-HRS has been delayed by COVID to mid-2021 and so GTC-HRS is expected at GTC on 2025-2026, although the schedule for its development is not established yet. In the meanwhile, and considering the delay of FRIDA, it is considered to offer HORuS at the Nasmyth B focus once that all maintenance works of this focus are finished after the OSIRIS migration.

Other GUC recommendations from previous GUC meetings were addressed in the update on science operations and instrumentation.

3.- Update on science operations

GUC members were given reports on the telescope and instruments performance of the telescope. The presentations can be downloaded from the GUC pages. In the following, a summary of the most relevant information is presented.

In semester 2020B, GTC offered four instruments (MEGARA, EMIR, OSIRIS and HORuS) with an over-subscription factor ~ 3.5 and almost 50% of the requested time meant for OSIRIS programs, mostly in long-slit mode. In S2021A, only three instruments were offered (MEGARA, EMIR and CanariCam) and the over-subscription factor declined to 2.3. EMIR requests added almost to 50% of the available time. A special call S2021S was issued offering observation time for OSIRIS and HORuS. As a result, the final over-subscription factor of the S2021A+S2021S period was 3.2.

In semester 2020B, time losses associated with technical issues stayed below 5%, with observatory overheads also below 2%. On the other hand, time losses associated with weather conditions were notably high, above 40%. As in the previous semester, 75% of the A queue programs and 40% of the B queue programs are completed.

The right ascension range between 10 and 14 hours is heavily oversubscribed because there are many GT programs requesting this range with priority even above A-band programs. This situation has worsened in 2020, when only 125 hours have been devoted to GT programs. It must be noted that the CanariCam GT programs have been completed. On the other hand, the lack of proposals for bright time noted in previous GUC meetings has been progressively alleviated in semester 2020A and 2020B.

The Quality Control upgrade has been completed including DRP-online products (EMIR & MEGARA). The requirements for a new Phase 0 Tool (Time allocation tool) have been completed too. New GTC operational tools are being developed, including Nightlog, Keograms and Scheduler tools. All these tasks are supported by new staff that has joined the GTC Scientific Operations Group in 2020-2021, which now consists of 12 members.

By March 1 2020, the number of published papers using GTC observations was 638, including 259 with a first author from Spain, 41 from Mexico and 19 from the UF. Most of these papers $\sim 88\%$ are based on OSIRIS data. By 2020, the time delay between the observation and publication of the data is getting close to 3 years, with a steady increase in this delay since 2011.

As for the operational plan for 2021A, approximately 80% of the time is envisaged for science. The remaining time will be devoted to MIRADAS installation and commissioning, telescope technical time and GTC installation preparation works. OSIRIS commissioning at Cassegrain has been delayed to 2021B. A Special Call for OSIRIS/HORuS proposals was opened on February 2021.

As for the operational plan for 2021B, approximately 70% of the time is envisaged for science. The remaining time will be devoted to MIRADAS installation and commissioning, telescope technical time, OSIRIS commissioning at Cassegrain and GTC AO installation preparation works. In this semester, MEGARA will be offered only on IFU mode and OSIRIS will be offered at the Cassegrain focus on a shared risk basis.

4.- Updates on instrumentation and GTC archive

There have been some new developments resulting in changes with respect to the schedule advanced in the previous report.

OSIRIS will be moved from its current location (Nasmyth B) to the Cassegrain focus on October 2021 (and thus it will be available for S21A until July 2021). It will be commissioned with its old detector, the new detector arriving in late 2021. OSIRIS will be back to operation on S2021B and the new detector will be routinely available by S2022A.

The GTC Steering Committee has approved the development of MAAT, provided the MAAT team obtains the funds, keeps the GTC staff support at a reasonable level and provides an acquisition and data reduction pipeline. MAAT schedule aims for on-sky commissioning in 2023.

Improvements on the EMIR DRP in imaging mode are ongoing (astrometry). At present, high detector noise prevents spectroscopy of sources fainter than about $m = 19-20$, but it is noted that EMIR sensitivity follows ETC v2.1.3 predictions. Direct support to users is provided via GTC Phase 3 tool. Funding has been received for a new detector for EMIR, which would eliminate current problems with faint targets. The new H2RG detector is expected to arrive in late 2021. In the meanwhile, flexures of EMIR and AG (EMIR is mounted at the Nasmyth A focus) have been recalibrated, leading to improvements in pointing, guiding and offsetting, which are very useful for dithering and ABBA patterns.

MEGARA final repairing works on MOS positioners were completed on October 2020, but an incidence with its pseudo-slit affected normal operations on S20A. This affected strongly its operations. MEGARA MOS positioners have been degraded with time. Currently, only 52 positioners are reaching the correct position when demanded. In the current situation, most of the MOS observing programs are affected. MEGARA MOS mode will not be offered to TACs until this situation is solved. On the other hand, the GTC staff has been trained to support VPH changes.

HiPERCAM was routinely operated on reserved observing runs, with support of the instrument team. For S21A an autonomous operation is expected, and so HiPERCAM is offered for observations to be executed at the beginning of the semester S21A (Mar-June 2021), although this schedule is uncertain due to COVID restrictions with UK. A feasibility study (fully funded by PI) to permanently mount HiPERCAM at FCass G focal station is progressing positively. HiPERCAM is expected to be back at the telescope in 2022.

HORuS is a visitor instrument that has been now included in the routinely operation queue after GTC staff's training conducted by the instrument team. Cryogenic problems in HORuS by mid November 2020 forced to suspend the instrument's operation. HORuS was mounted again on March 4th, 2021, thus it has been inoperative for 3.5 months. However, it was offered in the special call for proposals for S21A expecting to alleviate this issue. It is now considered to make HORuS available at Nasmyth B after OSIRIS migration to Cassegrain A. A specific interface is being developed. It will be offered for S21B once the on sky commissioning is completed at Nasmyth B.

Canaricam was finally removed from the FCass-E focal station in February 2021. It has delivered 875 h, resulting in 43 papers produced (best ratio for a GTC instrument).

The report on FRIDA casts concerns on delays in its development and shortfall of funding.

The GTC Archive, which is hosted by the SVO at CAB, now includes more than 411.000 raw science files. About 29% (139 out of 486) of the GTC papers have their reduced data in the archive. A protocol has been set up to run the HORuS pipeline in the GTC Archive environment. EMIR and OSIRIS imaging observations are also routinely added to the archive.

The GUC has conducted a poll to evaluate the opinion of the whole GTC community on the availability of pipeline products with little quality control in the archives. The poll directly asked for the suitability of offering reduced GTC data in the archive and the time delay between observations and data public release. Most replies came from staff astronomers (72.4%) and PIs of GTC programs (86.2%). There is a majority of positive responses (89.7%) for the release of reduced GTC data in the GTC Archive. Most responses (51.7%) favor data been released one year since the completion of the program (or the end of the last semester the program was active) and another important fraction (37.9%) favors one year since the PI is provided by the GTC archive with the reduced data year. Only a small fraction of the community (10.3%) favors the data release exactly one year after the observation of the data set is realized.

5.- Time Allocation Committee (CAT) summary for semester 21A

The Spanish CAT received 129 proposals for semester 2021A, 60% of them requesting GTC observing time, for a total of 1219 hours. After a Special Call for Proposals S21A, it amounted to 181 proposals for 1676, close to previous calls. With the standard 70% over-allocation, 966 h were allocated. The over-subscription factor has lowered to ~2.0 for the Spanish community.

6.- Summary of recommendations from the GUC

1.- The GUC encourages GTC to work in close contact with instrument teams to make sure that the highest productivity is obtained from the instruments and the pipelines guarantee that data are most useful. In this sense, the implementation of DRPs for EMIR and MEGARA are highly appreciated.

2.- The GUC would like to see the MOS mode of MEGARA working.

3.- The GUC would like a better communication to IPs of standing issues that are delaying the execution of proposals, especially those highly rated.

4.- The GUC appreciates the effort of GTC to have the high-resolution instrument HORuS working while HRS is being developed.