

# **REPORT OF THE 8<sup>th</sup> GTC USERS COMMITTEE MEETING**

HELD AT ORM

LA PALMA, 25-26 JUNE 2013

## **1. Recent progress related to past reports**

The GUC was informed of the developments carried out to the telescope and its associated instrumentation. The GUC is very well satisfied on the positive general advancement in several of the basic issues identified in previous reports.

A full report on these actions has been produced by GRANTECAN and it is attached to the GUC report.

## **2. Feedback from the user communities**

The GUC has received feedback from users in Spain and Mexico that can be summarized as follows:

- Users are very happy with the efficiency and performance of the long slit mode of OSIRIS. GRANTECAN and the OSIRIS team have been congratulated for this high success.
- Users urge to prioritize the MOS observations. It is expected to be offered by 2014A. MOS commissioning has already been started at GTC and it is in good shape. The results of the MOS commissioning will be made publically available through the GTC web. If everything works as expected, the MOS mode can be available during 2014.
- The OSIRIS Community urges a pipeline in operation with the functionality requested by the GUC in the previous meeting. The OSIRIS team has already delivered a preliminary version and hopefully will deliver a new one along this year. GUC is worried about the new delay in the pipeline, expected during first semester of 2013. Also GUC encourages the OSIRIS team for a fully automated version.
- Users also requested an update of the instrument OSIRIS: change of the CCD detector and upgrade to resolution 5000. The OSIRIS team has finance to purchase a new detector, and GRANTECAN is studying the complexity of this intervention, but no plans have been made yet to improve the resolution in the near future.

## CANARICAM

- CANARICAM users asked for maintaining a flexible scheduling of the instrument. This is needed to increase the chances of getting the right weather conditions required for the observations of CANARICAM programs. Information on the Precipitable Water Vapour (PWV) statistics can be obtained in the IAC WEB pages <http://www.iac.es/proyecto/site-testing/>. The PWV median value obtained during last year is 7 mm. The GUC acknowledges GRANTECAN for the huge effort done to prioritize this main objective. Now it is in operation most of the time and also for implementing the readout mode requested by the users to reach low surface brightness in extended sources.
- Users recurrently wonder about when spectropolarimetric modes will be available. The spectropolarimetry mode is given now higher priority and it is expected to be offered as soon as it is commissioned. As a consequence of this change in priority, high-resolution spectroscopy and coronagraphy will be commissioned at a later date.

## Phase 2

- Users asked once again longer than one hour OBs. GRANTECAN remember its policy that the observatory only guarantees the requested observing conditions for observing blocks up to one hour and therefore recommends using this duration as the maximum total length of any observing blocks. Also, a more sensible overhead scheme would be desirable. In some cases the overheads are perceived as excessive.
- Users are also worried on incomplete observations. Miriam Peña claims that the mexican community is very affected for this issue and obtains much less of the 3.75% of observing time which corresponds to this community. Different factors can be the cause for this and it is only possible to be analyse in a case by case basis. Therefore users are encouraged to contact GRANTECAN to find out the main reason of incompleteness after the semester ended. GUC acknowledge GRANTECAN and CAT for the decision that Q1 proposals will remain active during 3 semesters.

## GTC Operation:

- ESO/GTC programs. GRANTECAN pointed out that any question related to reserved targets and progress of the programs need to be asked to the ESO/GTC liaison Committee since it is ESO's responsibility. The reserved targets for each program can be found in the ESO pages, but GRANTECAN does not enforce this list of reserved targets by other users

- GUC acknowledges GRANTECAN for the good progress on ESO/GTC programs. Now they have reported about 70% completion. 2 out of 9 programs have been fully completed. ESO/GTC programs have been extended up to mid 2015. No priorities have been established by the ESO/GTC Liaison Committee for the ESO/GTC programs. The GUC considers that this might not be fair for those programs with a small observed fraction.

#### GTC New Instrumentation:

- Users highlighted the need for Near Infrared instrumentation at GTC. The CIRCE instrument has the end of 2013 deadline for the instrument being delivered to GTC, after which it can be commissioned and offered to the community. EMIR is in good shape with expected operation at the telescope in 2015.
- The second generation instrument MEGARA has passed PDR and delta-PDR and it is ready for the next development phase. GUC is very worried about the possible delay caused by funding and encourages GRANTECAN to overcome this worrying situation, within its resources.
- Visitor Instruments are welcome by GRANTECAN within the restriction imposed by the lack of human resources. They will be studied on a case by case basis.
- GRANTECAN informed that the revision of the current instrumentation plan for GTC is not ready yet and may happen during next semester. An international Committee will produce this revision. GRANTECAN acknowledges the new instruments have to wait until this revision is finished.

### **3. Summary of the GUC recommendations**

#### The GUC recommends:

1. Ready the OSIRIS MOS asap. A large amount of programs from the Community are awaiting this mode. GUC agreed with GRANTECAN to offer a Science Verification call for this mode during next semester.
2. Making available possible data reduction pipelines. This is especially relevant for the OSIRIS TF and MOS modes.
3. Getting new CANARICAM modes, spectropolarimetry and fast guiding, ready with updated information about the latest commissioning results.

4. Maintaining flexible scheduling for CANARICAM to allow observations of the highly demanding, in terms of weather conditions, CANARICAM programs. GUC does believe that CANARICAM offers a unique niche for GTC observations and the CANARICAM Community want to take advantage of the uniqueness of this instrument in the world.
5. Readyng the dome to enable observations at all sky positions. This will be especially relevant for extrasolar planets research.
6. Making better defined tools available to make it easier for the user to follow up the status of a granted observational program. GUC recommends making publically available on the GTC webpage the report of the semester observations upon completion.
7. Getting more input from the community. GUC has distributed a questionnaire to the GTC community, linked to GUC's blog, with the spirit to produce a proper evaluation of the level of satisfaction of users with the observations delivered by GTC. GUC considers that the questionnaire needs to stay operative for the coming semesters to collect information from the users.
8. Providing information to the Community on the results of the Revision of the Instrumentation Plan for GTC. The previous instrumentation plan from 2008 is accessible in the GTC web pages. GUC remarked to GRANTECAN the importance of keeping NIR and AO observations to get top science from GTC.
9. Improving the overall scientific efficiency compared with past semesters. The GUC endorses the continuous drive by GRANTECAN to improving it.
10. GUC endorses the different TACs and GRANTECAN efforts to keep track of the targets observed to avoid duplication of the observing targets. Also to keep the equilibrium in the science performed by GTC observations, correcting any bias if necessary.
11. Implementing the DDT program for the coming semesters, once the ESO/GTC programs have been finished. This information should appear more clearly stated on the GTC web.

## **GUC Members**

Josefa Masegosa	Instituto de Astrofísica de Andalucía, CSIC, chair (last meeting)
Almudena Alonso-Herrero	Instituto de Física de Cantabria
Jorge Sánchez	Instituto de Astrofísica de Canarias
Enric Pallé	Instituto de Astrofísica de Canarias
Miriam Peña	Instituto de Astronomía, UNAM, México (last meeting)
Nanda Rea	Instituto de Ciencias del Espacio, CSIC (absent)
Miguel Sánchez-Portal	European Space Agency Center

# **GTC STATUS REPORT**

## **to the**

### **8<sup>th</sup> GTC USERS COMMITTEE MEETING**

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#### **1. Introduction**

This is a summary report to keep the GTC Users Committee (GUC) informed on the GRANTECAN activities around the GTC. These activities are organised and presented here with the priority order at GRANTECAN: 1) science operations are the top ranked activity to maximise the science data production and quality; 2) technical operations to increase the robustness of the facility, to increase the capabilities of the current set of instruments and to develop tools to facilitate the telescope operation and data management; and 3) the development of telescope upgrades and new science instruments.

#### **2. Science operations**

Along the past year, from March 2012 to February 2013 (semesters 2012A and 2012B), a total of 266 nights (72.9% of the full year) were devoted to science programs (ESO/GTC science time included), a total of 5 nights (1.4%) were devoted to the ESO/GTC technical time program, and the remaining 94 nights (25.7%) were used for technical activities, including commissioning of some OSIRIS and CanariCam observing modes.

The science time was used by observing programmes in queue-scheduled observing mode on 244.4 nights (91.9% of the total science time) and in visiting-scheduled observing on 21.6 night (8.1%).

On average, during the time consumed for scientific observations in queue-scheduled observing mode, a 12.7% of time was lost due to technical faults and a 22.1% of time due to poor weather. A total of 965 hours of telescope time were delivered to the PIs in the form of 1247 observing blocks. The overheads of this queue-scheduled observing mode (common calibrations, discarded observations, empty queues, human factors, manual procedures, etc.) consumed 477 hours (33.0% of real time available once corrected for weather and technical losses).

The science time was consumed by CAT programs (79.7% of the total science time), ESO/GTC science programs (14.1%), CCI International Time Programs (2.1%) and CanariCam Guaranteed Time (4.1%).

Along that year, 95 CAT observing proposals were attended and got GTC data. Up to 51 (53.7%) of them were completed.

Observing programmes are ordered in the queues and executed following the priorities fixed by the TACs. The Spanish TAC now publishes program ranking in terms of quartile blocks to facilitate a better understanding of the relative priority of

each observing program.

Some 62 publication in refereed journals have been published since the beginning of GTC operations in March 2009.

For the coming semester, 2014A, it is expected to devote 80% of the time to science programmes and to offer the broad-band imaging, including the SHARD filters, RTF, BTF (between 450 to 650nm), long-slit spectroscopy, MOS, Frame transfer and Fast Photometry modes of OSIRIS, and low resolution spectroscopy, imaging (not at the diffraction limited resolution) and imaging polarimetry with CANARICAM. Non sidereal tracking will also be available.

The possibility of giving continuity to some observing programs from one semester to another is in the hands of the TACs.

### **3. Technical operations**

Technical work is focused with maximum priority to the following items: a) to improve the robustness of the system with the aim to reduce the average fault rate; b) to increase the utilities and tools available for night operations and quality control to reduce the observing overheads and increasing the volume and quality of delivered data; and c) to complete the remaining observing modes of OSIRIS and CanariCam and to correct the dome vignetting issue.

In contrast with the past semester 2012B, when a M2 mayor failure forced to a long telescope shut down that increases the technical fault statistics up to 18%, the current semester 2013A is running with much less technical faults and its statistic is as low as 5%.

The segment coating process has reached a steady state of two segments per month. An onsite segment cleaning process with CO<sub>2</sub> is also done every month or twice every month when high level of dust happens at site. With this processes the M1 reflectivity is maintain at 84% and the total reflectivity of the telescope (through the three mirrors) is 65%.

Two segments have shown some cracks at some of their vertexes. They were repaired with the help of the blank providers, SHOTT, who also train the GRANTECAN personnel to correct similar future cracks if they appear again. A detailed review of the segment handling procedures has been done and some improvements added to reduce any risk on these delicate telescope parts.

A new GTC Control System (GCS) release has been developed and is under test at the telescope. This release means a major improvement of the GCS including some new functionality, fixing bugs and increasing robustness. It is expected to complete its commissioning shortly.

The OSIRIS cutting mask machine was delivered at the Observatory in February and the final acceptance process and personnel training was successfully done some weeks later.

A large CanariCam stand down happens early 2013. It was due to an unexpected cold head failure. That stand down was also used to make some improvements on the instrument, like reliability improvement of all the services related with the instrument cooling and CanariCam cabinet improvements according to EU electrical regulations. That large stand down was also an opportunity to make some maintenance tasks of the A&G systems at that focal station.

Other programs are still running or completed. The non-sidereal tracking capability was completed and already available. The problems with the OSIRIS calibration system (ICM) were fixed. The fast-guiding functionality is well advanced but waiting for some major repairs in the fast guide camera at the CanariCam focal station. And the troubles identified on the Monitor Manager and on the FITS headers are expected to be fixed with the new GCS release that is under implementation.

### **3.1 OSIRIS**

The blue TF mode of OSIRIS is already available between 450 and 650nm. The shorter wavelength range will be commissioned once the required blocking filters arrive. They are expected by late 2013.

The frame transfer and fast-photometry modes are also available since semester 2013B.

The OSIRIS MOS mode is nearly completed its commissioning and will be offered for semester 2014A.

The OSIRIS pipeline continues being tested by the OSIRIS extended team. It is expected to be delivered before the end of this year.

Charge-shuffling CCD readout modes and high-speed spectroscopy are not offered yet.

### **3.2 CANARICAM**

Imaging, low-resolution spectroscopy and imaging polarimetry in the N and Q band are the CanariCam observing modes currently offered.

Spectro-polarimetry is currently under commissioning by GRANTECAN with the generous collaboration of some members of the instrument team in a best effort basis. High-resolution spectroscopy and coronagraphy are waiting in the queue. The progress on these commissioning activities is limited by the availability of skilled resources at GRANTECAN.

The progress to get data from CanariCam is limited by the high values of PWV along the past years. Users have been invited to take this into account when setting the PWV limit in their observing proposals.

The performance of CanariCam is also somewhat hampered because the fast-guiding functionality of the telescope is not yet ready. It is under test at the telescope but delayed due to some failures at the Nasmyth-A A&G Box that have to be solved in a near future.

This instrument have suffered a long stand down since early 2013 due to an unexpected failure of its cool head and He compressor. These parts of the



instrument have shown a quite delicate behaviour that is requiring an unusual effort from the GTC staff. A major change in this system will be required to solve these instrument instabilities. It is something to study in a future due to the current workload around the GTC.

## **4. New instruments**

### **4.1 EMIR**

EMIR is initiating its first tests at the system level at the IAC labs. Only the Configurable Slit Unit or CSU has not been delivered yet but it is under final factory test at the provider workshops and at the IAC cryogenic facilities. Current IAC plans indicate that the instrument acceptance test and delivery will happen along the second half of 2014.

According to the current schedule, EMIR will be commissioned at the GTC once delivered and installed at the GTC. It is expected to be offered to general use no earlier than semester 2015B.

EMIR will be installed at the Nasmyth A focal station, where CanariCam is currently located. At that time CanariCam will be moved to a Folded-Cass focal station (currently under development) and re-commissioned there.

### **4.2 CIRCE**

CIRCE is a visitor instrument from the University of Florida (UdF). It is currently under integration and test at the UdF labs. The UdF plans to complete it by the end of 2013. CIRCE could be installed at a Folded-Cass focal station and commissioned near mid of next year 2014 but only if EMIR suffers a major delay that justifies the effort getting CIRCE in operation.

### **4.2 FRIDA and Adaptive Optics**

FRIDA held its Critical Design Review (CDR) past September 2011. Some open issues remain from that CDR that are pending to be closed along the following months.

The FRIDA schedule shows that it will be completed for lab acceptance along 2015. Later it will be received at the Observatory, mounted and commissioned, something that, due to the complexity of this instrument and the AO system that feeds it, will extend well into 2016.

The AO System, under development by GRANTECAN, is preparing an operational system in the lab by the year 2014. Once intensively tested at lab, it has to be installed and commissioned at the GTC Nasmyth B focal station prior to the installation of FRIDA.

But OSIRIS is currently at that focal station and it will be moved to the Main Cassegrain focal station once it is built for continuing OSIRIS operation. This conflict between instruments (OSIRIS and FRIDA+GTCAO) and focal stations available (nasmyth-B and main cassegrain) is fully dependent on the limited resources available and has to be addressed shortly.

### **4.3 MEGARA and MIRADAS**

Both represent the new generation of GTC instruments. After a successful Preliminary Design phase MEGARA has afforded the detailed design of its optics and the procurement of the most critical blanks. Subsequent development of MEGARA and its final schedule is now conditioned by the availability of resources that are being identified.

MIRADAS has also passed successfully its preliminary design phase. A final decision on this future instrument will be conditioned by a revised instrumentation plan and the available resources.

GRANTECAN has initiated a review of the GTC Instrumentation Plan based on the recommendations made by an external peer committee in 2008. An updated Plan has to configure the current and future development of the GTC instrumentation well in accordance with the available and expected resources.

### **4.3 HORUS**

HORUS is a single source high resolution (50000) visible spectrograph proposed by the IAC as a visitor instrument and based on the old UES spectrograph used at the WHT. This proposal is currently under study.

### **4.4 Telescope upgrades**

The main telescope upgrades ahead are the preparation of the new focal stations required for the new set of instruments: The two Folded-Cass and the Main-Cass focal stations. The first one is currently under development but the second one is waiting for resources.