ANNOUNCEMENT OF OPPORTUNITY FOR OBSERVING TIME AT THE GRAN TELESCOPIO CANARIAS

SEMESTER 2018B: September 1st 2018 – February 28th, 2019

Submission deadline: ***3 April 2018, 23:59 (Canary Islands time)***

GRANTECAN opens a call for observing proposals for Semester 2018B on the 10.4-m Gran Telescopio Canarias (GTC) for its user community. This semester runs from September 1st 2018 until February 28th 2019. Time is open for both queue-scheduled and classical visitor-mode observing.

All interested applicants must use the IAC's CAT on-line system for submitting their proposals. This can be found at http://www.iac.es/OOCC/night-cat/call-for-proposals/ where also instructions are provided. The **deadline for submission is 3 April 2018 at 23:59 local time in the Canary Islands (or 22:59 UT)**. Proposals that are approved by the respective time allocation committees will be asked to provide detailed observing information in "Phase 2" of the submission process. For a more extensive description of how the observing process at GTC is organized please refer to http://www.gtc.iac.es/observing/

We note that the Time Allocation Committees may decide to extend the duration of the observing period for certain programs over more than one semester.

1. Available observing time

During semester 2018B the majority of the available observing time will be used for science operations, with some 20% being needed for telescope improvement and instrument commissioning that will be preferentially carried out during bright time. The remaining 80% will be dedicated to programs that are granted time under this call, as well as guaranteed time for instrument builders and for the CCI International Time.

We **note that the R.A. range at 2 hours and from 10 to 12 hours are highly subscribed by approved high-priority large programs.** Hence competition for time in these R.A. bands, in particular during dark/grey time and good seeing, will be fierce.

GTC accepts target-of-opportunity (ToOs) override proposals. GTC´s procedure for triggering ToO observations can be found at http://www.gtc.iac.es/observing/too.php .

For S18B, **no Large Programmes are offered at GTC**.

2. Instrumentation

Details of the instruments can be found at http://www.gtc.iac.es/instruments/, including the observing programs for guaranteed time and their reserved targets. **The most important changes from previous semesters are *i)* the optical MEGARA spectrograph is available both in Integral Field Unit and MultiObject Spectroscopy operation modes, *ii)* the near-infrared EMIR instrument is available for imaging and long-slit spectroscopy, replacing the CIRCE imager that is not offered any longer; *iii)* the high-speed, 5-band HiPERCAM visiting instrument will be offered on shared-risk basis at the beginning of the semester (September-October 2018).**

OSIRIS:

The OSIRIS spectrograph and imager for the optical wavelength range will be available in the Nasmyth-B focal station. Available observing modes are:

- Broad-band imaging
- Medium-band imaging (SHARDS filters)
- Long-slit spectroscopy
- Multi-object spectroscopy
- Tunable filter imaging using the “red” and “blue” tunable filters
- Frame transfer and fast photometry mode (only supported in visitor-observing mode)

For the MOS mode we highlight the following important constraint: MOS observations will only be carried out for proposals that are highly ranked by the TACs (i.e. in the top half for the Spanish CAT, first and second quartiles). The reason for this is to increase the possibilities to exploit the significant investment in designing and producing the multi-slit masks. Proposals requesting MOS mode that are not sufficiently highly ranked will hence be rejected. For further practical limitations we point the interested reader to http://www.gtc.iac.es/instruments/osiris/osirisMOS.php. Note that from S16A onwards, slit widths as narrow as 0.63 arcsec are allowed, but users always must be aware of the 0.1 arcsec (r.m.s.) accuracy achievable in the slit positioning when defining the scientific goals of the program.

We emphasize the availability of a large medium-band filter set, referred to as the SHARDS filters in reference to the project led by Dr. Pérez González who has offered these filters for general use. Further details, and how to apply for their use, may be found at http://www.gtc.iac.es/instruments/osiris/osiris.php#SHARDS_Filters

We remind applicants that the standard CCD readout speed is 200 kHz for all observing modes.

MEGARA:

For semester S18B MEGARA optical spectrograph will be made available with all its capabilities, both integral-field Unit (IFU) and multi-object spectroscopy (MOS) at intermediate-to-high spectral resolutions (R~5,500, 12,000 and 20,000 respectively for the LR, MR and HR modes).

Despite Semester S18B runs from September 2018 to February 2019, in order to enhance the MEGARA instrument exploitation, **MEGARA proposals for S18B will be allowed to be executed from July 1st 2018 onwards, extending the target visibility to earlier R.A. values. Applicants can take advantage of this increased flexibility when preparing the proposals.**

EMIR:

The EMIR near-infrared wide-field imager and medium-resolution spectrograph will be available in the Nasmyth-A focal station. Observing modes that will be offered in the present call are:

- Broad-band imaging (Y, J, H, Ks filters).
- Narrow-band imaging ([FeII],$[FeII]_{cont}$,Brγ, $Br\gamma_{cont}$,H_2(1-0),H_2(2-1)).
- Long-slit spectroscopy (0.6”, 0.8”, 1.2”, 1.6”, and 5.0” slit widths).

HiPERCAM:

The HiPERCAM high-speed, multi-band imager is a new GTC visitor instrument (P.I. Vik Dhillon) that will be located in the Folded-Cass E focus. HiPERCAM will be able to image simultaneously in 5 channels (u', g', r', i', z') and to frame at (windowed) rates of well over 1 kHz in a FOV of 3.9' with a 0.113"/pix plate scale.

HiPERCAM was received at the telescope on January 2018, and it is offered to the GTC community **on a 'shared risk' basis.** The future arrival of Canaricam at FCass-E station before the end of 2018 will produce the Hipercam removal from that station. For this reason, HiPERCAM applicants must be aware that **observations must be concentrated at the beginning of the semester (September-October 2018)** as the use of HiPERCAM after those months cannot be ensured.

Further information about the instrument is found in the GTC web pages at http://www.gtc.iac.es/instruments/hipercam/hipercam.php and/or contacting the instrument PI at vik.dhillon@sheffield.ac.uk

3. Reserved objects

The science teams of OSIRIS, MEGARA, EMIR and HiPERCAM are granted guaranteed observing time. The objects and observing modes planned for their observations on GTC are reserved for the exclusive use by the instrument science teams. Target lists of reserved objects may be found on the instrument web pages at http://www.gtc.iac.es/instruments/, following the links for the corresponding instrument.

4. Telescope status

There is no significant news from previous semesters, the former dome shutter limitation having been removed since the end of 2015.

5. Observing overheads

It is important to make realistic estimates of the observing overheads at the time of writing a proposal, as well as when completing the Phase-2 observing definition. As a guideline, for an OSIRIS observation in both imaging and spectroscopy mode a total overhead of 10 minutes per observing block should be accounted for, while for tunable filter imaging the total overhead increases to about 20 minutes, to account for the TF calibration process. For MEGARA, 10 min are also assumed for target acquisition in IFU mode, while 15 min are considered for Multi Object Spectroscopy mode. Finally, for HiPERCAM the same overheads than OSIRIS/MEGARA (10 minutes per observing block) will be considered for configuring the instrument.

In the case of EMIR, an observation in imaging mode a total overhead of 10 minutes per observing block should be accounted for, while for longslit spectroscopy the total overhead increases to about 20 minutes, to account for the CSU configuration and acquisition process, except in the case of telluric standard observations where CSU re-configuration is not necessary and only 10 min of overheads are accounted for. In addition to the overheads for target acquisition and instrument/telescope setup, there are also overheads associated to the observing technique. **For typical science exposures, open-shutter efficiency for EMIR is about 70% in imaging and 90% in spectroscopy (including dithering, readout overheads, etc.).** To optimize the telescope

time for a predefined on-source integration time, applicants should use the *EMIR efficiency calculator* available at:

www.iac.es/proyecto/emir/pages/observing-with-emir/observing-tools/efficiency-calculator.php

To accurately estimate overheads**, a Phase 2 simulator is available at http://gtc-phase2.gtc.iac.es/science/F2/. We strongly recommend the use of this simulator to determine the total telescope time to be requested in the present call for proposals**.

In the case of the use of the OSIRIS tunable filter and when using EMIR, for reasons of overall efficiency and since these calibrations are specific for each observing program, we require that applicants define their night-time calibrations also as observing blocks. The time necessary for these calibrations will be charged to the observing program and should therefore be included in the time request.

See http://www.gtc.iac.es/observing/ for further details.

6. Telescope Support Model

Observations can be either carried out in *queue-scheduled service mode* by trained GTC support astronomers, or the PIs may express their preference to personally execute the observations on specific nights proposed by the GTC team (*classical visitor mode*). The PI must (i) clearly indicate her/his preference in the proposal form by selecting the appropriate option -"service" or "classical"- in the corresponding box of the proposal form, and (ii) in the case of classical observations define a valid backup program that can be carried out if the observing conditions required for the principal program are not met.

Queue scheduling provides flexibility in the execution of the observations optimizing the science return of the telescope. Priority is given to the scientifically most highly ranked proposal that is suitable for the observing conditions. Statistically, proposals with relaxed observing constraints will have a better chance of being completed successfully. In classical visitor mode, on the other hand, dates of observation are fixed by the GTC team and the risk of poor weather conditions and technical failures rests with the PI, but has the advantage that the observing plan can be adapted by the PI in real time.

In classical visitor mode, the PI will normally be present at the telescope during the observations, although the interaction with the telescope system will mostly be carried out by trained observatory personnel. The data are immediately made available to the PI. Remote visitor mode is also supported in GTC. If on the scheduled dates the PI cannot travel to the observatory, then the GTC support astronomer will carry out the observations in service mode, with the possibility of remote connection of the PI that allows real-time assessment of the data quality and the opportunity to adjust the observing parameters.

Visitor programs will only be admitted for those programs that fall in the top half of the TACs ranked list (first and second quartiles). Lower ranked programs will automatically be placed in the observing queue, except for those requesting observing modes that are only admitted in visitor mode (e.g. programs using high-speed readout modes of OSIRIS).

GRANTECAN will aim to follow the preference of the PI when drawing up the observing schedule, but no guarantee can be given that all preferences can and will be honored. In particular, in case a proposal conflicts with high-priority programs, or in case of a low ranking by the TAC, the proposal will not be scheduled in classical visitor mode.

Data obtained in queue mode are provided to the users via GTC FTP service once they pass the data quality assessment. Files are available for a 50-days period, so we recommend users to retrieve these and inform GTC as quickly as possible if any problem is found with the quality of data, so that GTC can assess the problem and if necessary, to repeat the observations. For all observations, after the one-year proprietary period the raw data are copied to the GTC Public Science Archive, hosted at the Center for Astrobiology in Madrid (http://gtc.sdc.cab.inta-csic.es/gtc**). PIs will be contacted by the CAB archive staff and asked to submit their reduced data once published.**

For general queries, please contact Antonio Cabrera Lavers: antonio.cabrera@gtc.iac.es