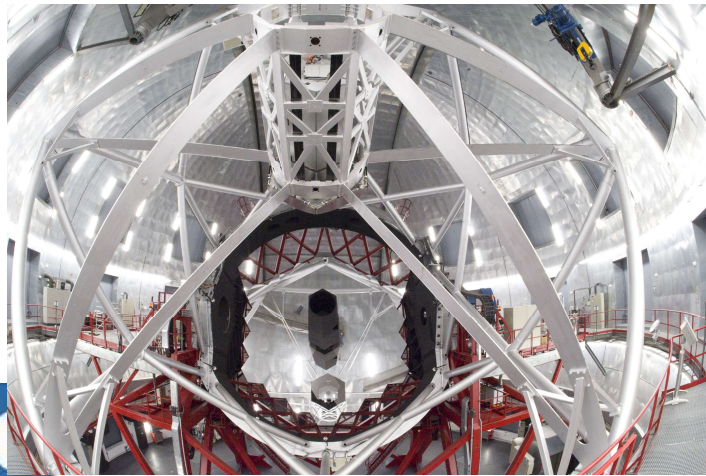
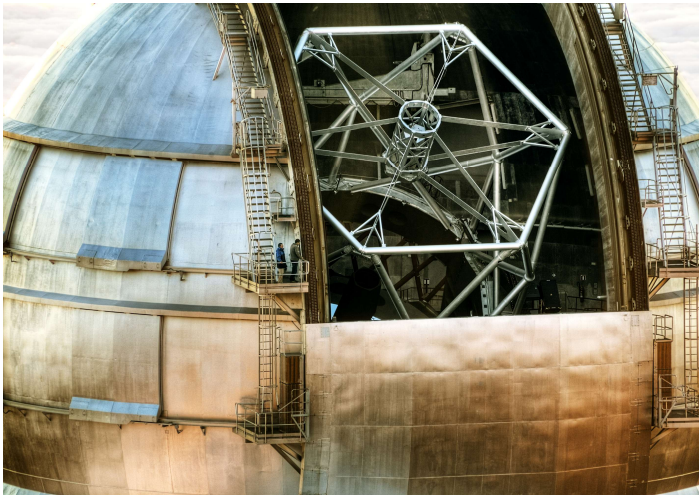


GTC Science Operations and Instrumentation plan

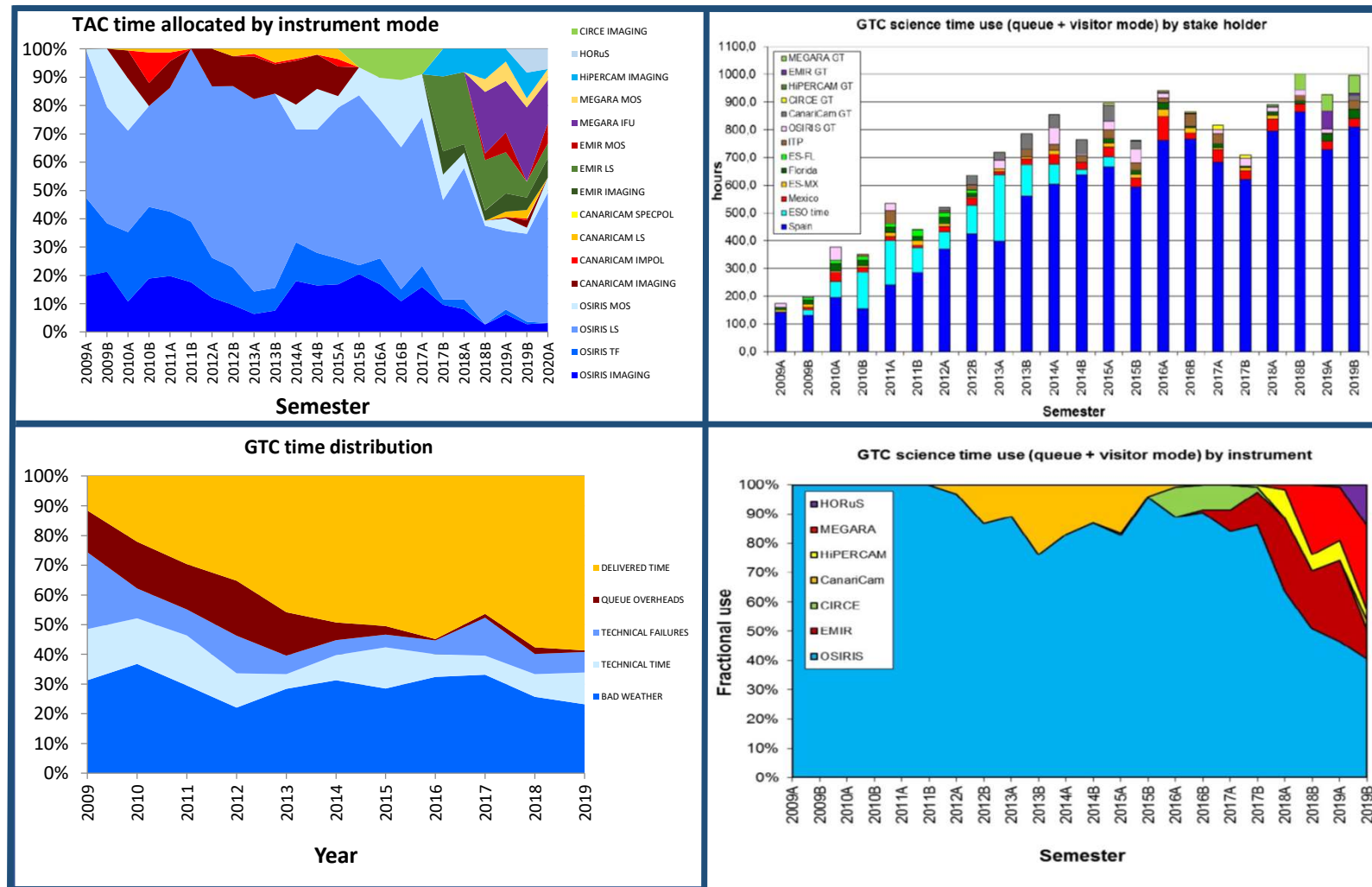
Antonio Cabrera-Lavers
GRANTECAN

Gran Telescopio Canarias (GTC) is producing science in a routinely manner since 2009, but at the same time enhancing its capabilities with the continuous advent of new instruments at the facility. This contribution summarizes the current status of the night operation of the 10.4 m GTC and describe GTC short- and medium- term instrumentation plan in the period 2020-2025.



GTC science operation in numbers

- GTC started science operations on 1st March 2009.
- Up to 7 different instruments have been used in operation to date.
- > 15,000 observing hours delivered to date (1800 h / year), including 1098 h for ESO/GTC and > 1000 h of GT.
- > 770 programs 100% completed with conditions guaranteed.
- Observatory overheads decreased to <1 %.
- ~ 4-5 % technical losses.



GTC current instruments suite / observational capabilities

OSIRIS imager and multi-object spectrograph



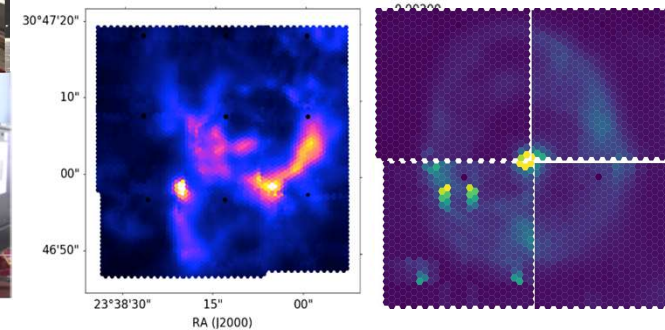
Spectral Range	0.36-1.00 μm
Detector	2 x Marconi 2k x 4k
Plate Scale	0.125 arcsec pix^{-1}
Field of view	7.8 x 7.8 arcmin ²
Imaging modes	broad/medium band, TFs, fast photometry
Spectroscopic modes	long-slit, mask MOS
Spectral resolution	300 to 2500



MEGARA optical medium-res multi-object spectrograph



Spectral range	0.365-1.00 μm
Detector	E2V CCD231-84-1-E74
IFU field of view	12.5 x 11.3 arcsec ²
IFU spaxel size	0.62 arcsec
MOS	92 x 7-fiber mini-IFUs
MOS field of view	3.5 x 3.5 arcmin ²
Spectral resolution	6000 to 20000
# of spectra	650

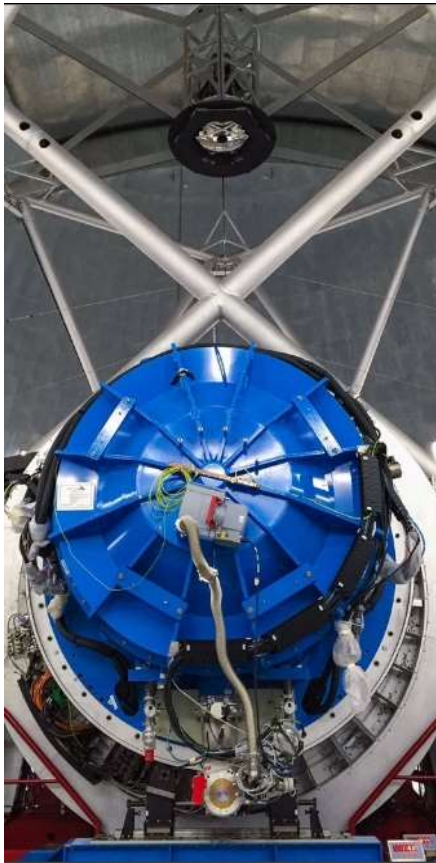


<http://www.gtc.iac.es/instruments/osiris/osiris.php>

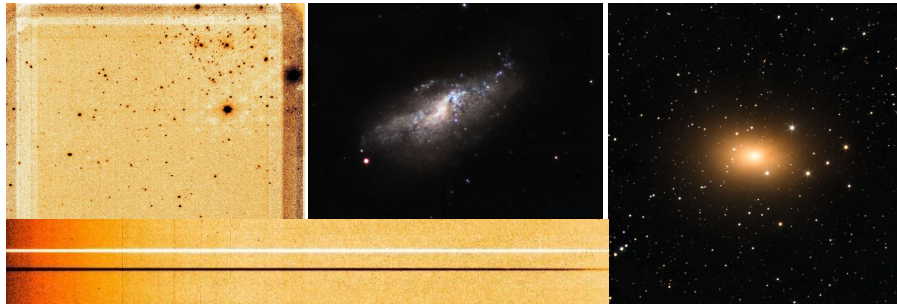
<http://www.gtc.iac.es/instruments/megara/megara.php>

GTC current instruments suite / observational capabilities

EMIR NIR imager and multi-object spectrograph



Spectral Range	0.9-2.5 μm [1.1-2.5 μm]	MOS mode	
Detector	HAWAII2 2048 ²	F.O.V.	6.7 x 4 arcmin ² (55 slitlets)
Spectral resolution	1000 (YJ, HK) 5000,4250,4000 (JHK)	Sensitivity	K~20.0 in 3h, for S/N=3 (continuum)
Spectral coverage	1 single window/exp.		1.4x10 ⁻¹⁸ erg/s/cm ² /Å @ S/N=6 (line)
Imaging modes	Broad/narrow band	Imaging mode	
Plate Scale	0.2 arcsec pix ⁻¹	F.O.V.	6.7 x 6.7 arcmin ²
Image quality	$\theta_{80} < 0.3$ arcsec	Sensitivity	K~22.0 in 1h, for S/N=3 & 0.6 arcsec aperture

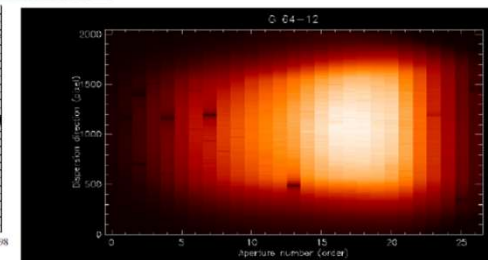
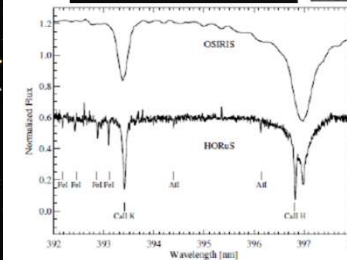
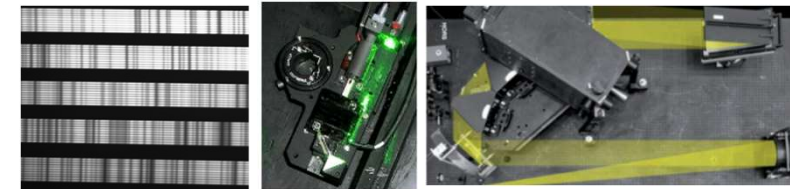


<http://www.gtc.iac.es/instruments/emir/emir.php>

HORuS: High Optical Resolution Spectrograph



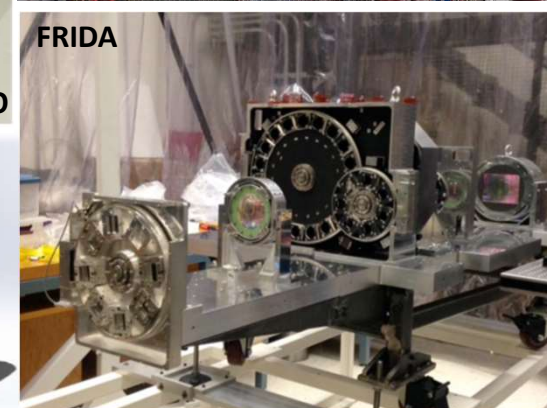
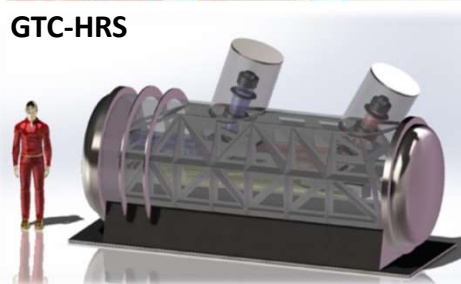
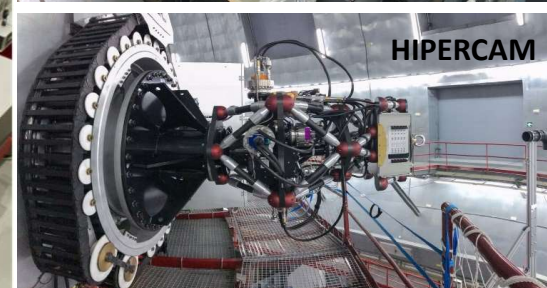
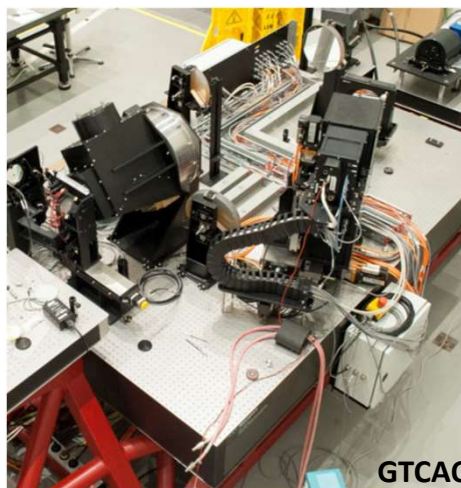
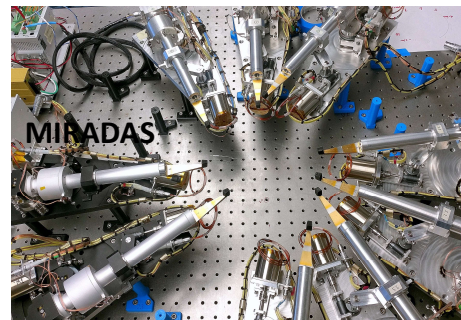
Spectral Range	0.38-0.69 μm
Detector	4096 x 4096 Fairchild CCD486 BI
IFU Field of view	2.3 x 2.3 arcsec ²
Fiber size	0.75 arcsec
Spectral Resolution	25000



<http://www.gtc.iac.es/instruments/hors/horus.php>

GTC instrumental plan (2020-2025)

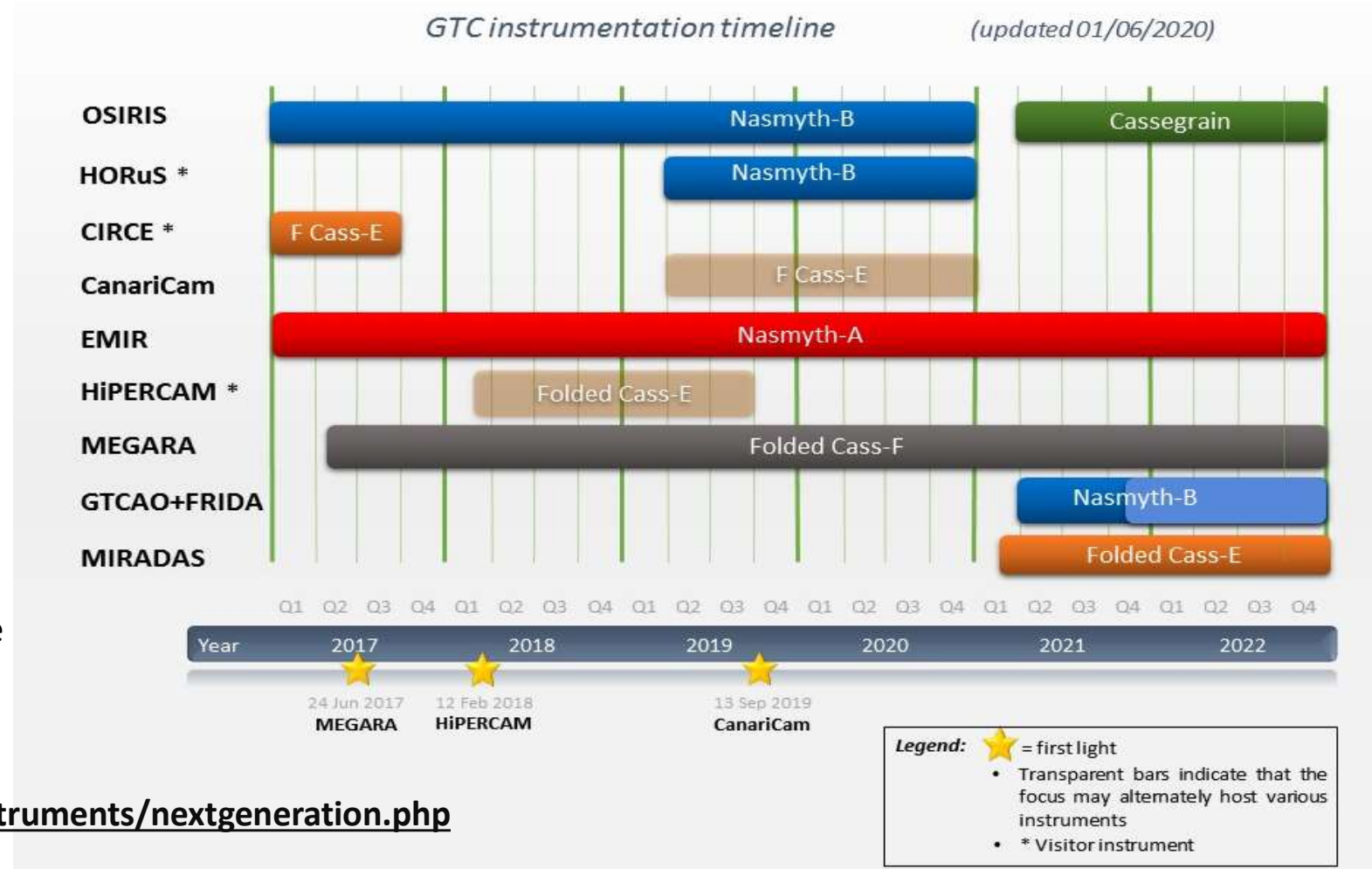
- **OSIRIS** will be moved to Main Cassegrain focal station in 2021, due to the arrival of GTCOA system. A new detector will be incorporated by the end of 2021, and a new module (MAAT) to be used in OSIRIS is currently under discussion.
- **HORuS** will be in operation while OSIRIS is available at Nasmyth-B focal station.
- **Canaricam** will be decommissioned once remaining GT is completed (before the end of 2020).
- **MIRADAS** will be installed and commissioned on March 2021. If longer delays are produced, **HIPERCAM** will be temporarily mounted again at Folded Cass E. In any case, HIPERCAM will be back in a permanent focal station by 2022.
- **GTCOA** is steadily progressing. It's expected at the telescope on early 2021 (NGS). **FRIDA** will be available on late 2021-early 2022.
- **GTC-HRS**, developed by NAOC-NIAOT, has passed successfully its CDR on June 2019, and the instrument will be completed by 2025 (it will be operated at Coudé focal station).



GTC instrumental plan (2020-2025)

- Call for next generation instruments (2025+) is still open.
- 5 proposals received to date.
- First scientific evaluation by GTC STAC on April 2019 recommended to define an external panel of experts to review these proposals, in a wider context of the strategic role of GTC from 2025 onwards.
- Process is presently stalled due to the lack of funding commitment from Canarian Government.

<http://www.gtc.iac.es/instruments/nextgeneration.php>



<http://www.gtc.iac.es/instruments/instrumentation.php>