



**Climate Action  
and  
Light Pollution Threat**



**Project number:  
KA220-SCH-A710136B**

Hands-on Robotic Telescopes

Gustavo Rojas - NUCLIO  
CliC-PoLi Summer School  
July 12, 2022

This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein. Project No.KA220-SCH-A710136B



Co-funded by the  
Erasmus+ Programme  
of the European Union

# Planning your observing with Stellarium



[www.stellarium.org](http://www.stellarium.org)



# Planning Steps

- Set up location
- Search object
- Check FOV
- Estimate exposure time
- Determine best epoch
- Other factors



# Set up Location



Location window [F6]

### Location



- 'Afak, Iraq
- 'Ain Abid, Algeria
- 'Ain Benian, Algeria
- 'Ain Deheb, Algeria
- 'Ain Merane, Algeria
- 'Ain el Bell, Algeria
- 'Ain el Berd, Algeria
- 'Ain el Hammam, Algeria
- 'Ain el Melh, Algeria
- 'Ain el Turk, Algeria
- 'Ajlun, Jordan

Reset Location List

---

#### Current location information

Latitude:	N 35° 19' 38.64"	Name/City:	Heraklion
Longitude:	E 25° 7' 41.16"	Country:	Greece
Elevation:	0 m	Planet:	Earth
<input type="button" value="Get location from GPS"/>		Time zone:	Europe/Athens

Get location from Network       Use custom time zone  
 Use current location as default       Enable daylight saving time

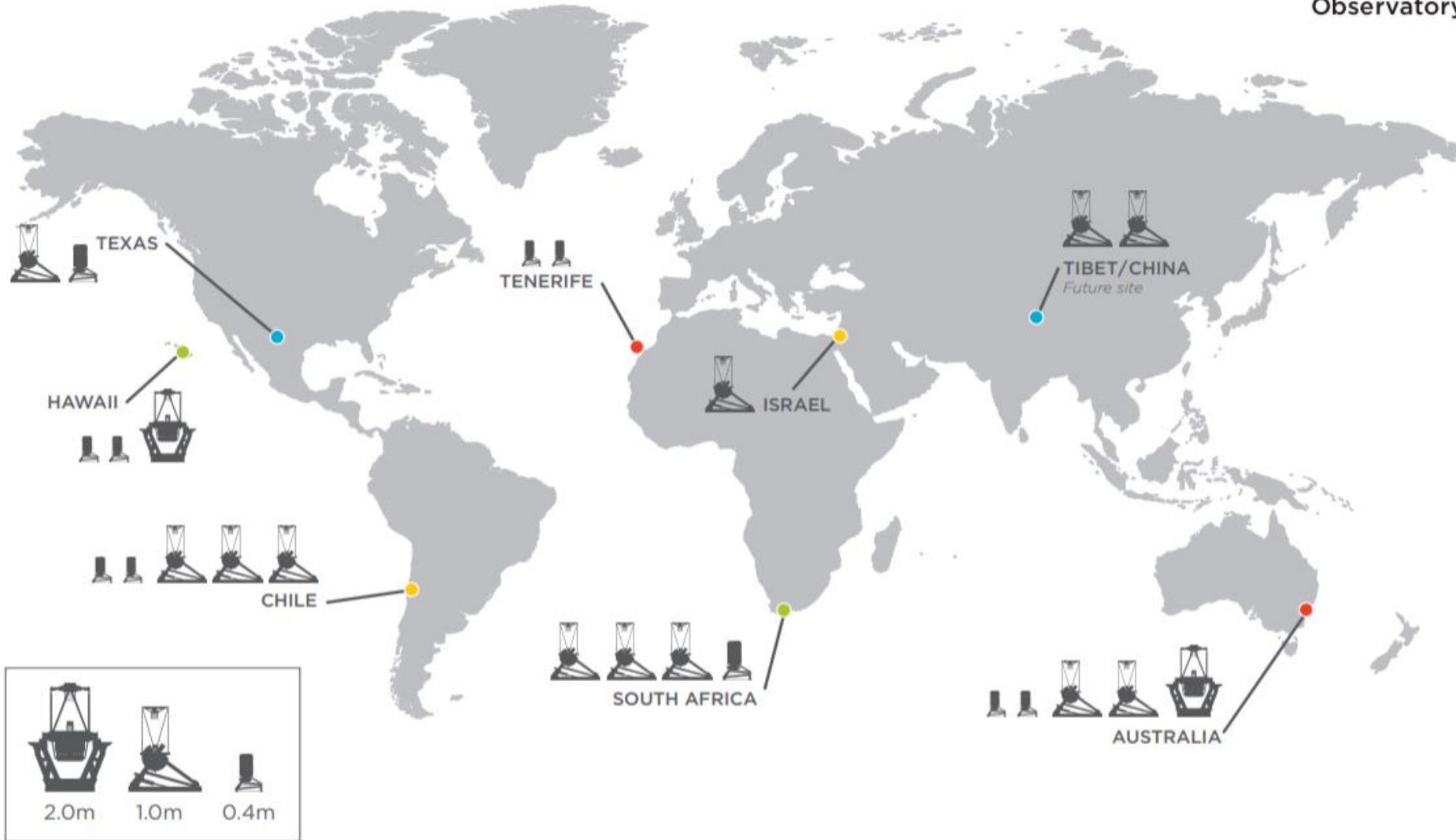


SE



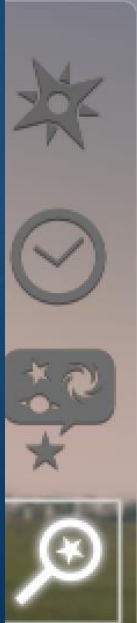


# GLOBAL TELESCOPE NETWORK



Set up  
Location

# Search Object



Search window [F3]

Search window

Object SIMBAD Position Lists Options

M31

M31, ORBCOMM FM31, M 31

Simbad Lookup: Found

Greek letters for Bayer designations

α	β	γ	δ	ε	ζ	η	θ	ι	κ	λ	μ
ν	ξ	ο	π	ρ	σ	τ	υ	φ	χ	ψ	ω

# Check FOV



**View** [X]

Sky SSO DSO **Markings** Landscape Starlore Surveys

Celestial Sphere

<input type="checkbox"/> Equatorial grid (J2000)	<input type="checkbox"/> Equator (J2000)	<input type="checkbox"/> Celestial poles (J2000)
<input type="checkbox"/> Equatorial grid (of date)	<input type="checkbox"/> Equator (of date)	<input type="checkbox"/> Celestial poles (of date)
<input type="checkbox"/> Ecliptic grid (J2000)	<input type="checkbox"/> Ecliptic (J2000)	<input type="checkbox"/> Ecliptic poles (J2000)
<input type="checkbox"/> Ecliptic grid (of date)	<input type="checkbox"/> Ecliptic (of date)	<input type="checkbox"/> Ecliptic poles (of date)
<input type="checkbox"/> Azimuthal grid	<input type="checkbox"/> Horizon	<input type="checkbox"/> Zenith and Nadir
<input type="checkbox"/> Galactic grid	<input type="checkbox"/> Galactic equator	<input type="checkbox"/> Galactic poles
<input type="checkbox"/> Supergalactic grid	<input type="checkbox"/> Supergalactic equator	<input type="checkbox"/> Supergalactic poles
<input type="checkbox"/> Equinoxes (J2000)	<input type="checkbox"/> O./C. longitude	<input type="checkbox"/> Antisolar point
<input type="checkbox"/> Equinoxes (of date)	<input type="checkbox"/> Meridian	<input type="checkbox"/> Apex points
<input type="checkbox"/> Solstices (J2000)	<input type="checkbox"/> Prime Vertical	<input type="checkbox"/> Circumpolar circles
<input type="checkbox"/> Solstices (of date)	<input type="checkbox"/> Colures	Line thickness <input type="text" value="1"/>
<input type="checkbox"/> Cardinal points	<input type="checkbox"/> Precession circles	Partition thickness <input type="text" value="1"/>
<input type="checkbox"/> Center of FOV	<input type="checkbox"/> Rectangular FOV <input type="text" value="4,00"/> <input type="text" value="3,00"/> <input type="text" value="0,0"/>	<input type="checkbox"/> Circular FOV <input type="text" value="0,1"/>

**Decimal Degrees!**





# FOV

Name	Telescope Class	Pixel scale "/pix (std. binning)	Field of view	Overhead per frame	Filter options
MuSCAT3	2-meter	0.27 (bin 1x1)	9.1'x9.1'	6s or 46s	SDSS g'r'i'zs fixed
Spectral	2-meter	0.300 (bin 2x2)	10'x10'	19s	18
Sinistro	1-meter	0.389 (bin 1x1)	26'x26'	28 s	21
SBIG 6303	0.4-meter	0.571 (bin 1x1)	29'x19'	14 s	9

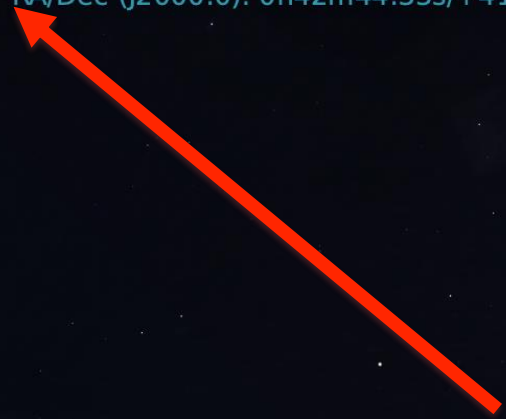


# Estimate Exposure Time



Andromeda Galaxy (Andromeda Nebula - Great Nebula in Andromeda)  
M 31 - NGC 224 - PGC 2557 - UGC 454

Magnitude: 3.44 (reduced to 3.59 by 1.17 Airmasses)  
RA/Dec (J2000.0): 0h42m44.33s/+41°16'07.5"



Check magnitude!



# Estimate Exposure Time



Estimates for 2-m exposure times

Mag	Exposure time (s)
10	5
11	15
12	40
13	100
14	240
15	600

1 magnitude = 250% more exposure time



# Determine best epoch

The screenshot shows a 'Configuration' window with a sidebar on the left and a main content area on the right. The sidebar lists various plugins, with 'Observability Analysis' highlighted. The main content area displays the following text:

### Observability Analysis

Displays an analysis of a selected object's observability (rise, set, and transit times) for the current date, as well as when it is observable through the year. An object is assumed to be observable if it is above the horizon during a fraction of the night. Also included are the dates of the largest separation from the Sun and acronychal and cosmical rising and setting. (Explanations are provided in the 'About' tab of the plugin's configuration window.)

Authors: Ivan Marti-Vidal (Onsala Space Observatory)  
Contact: i.martividal@gmail.com  
Version: 1.2.4  
License: GNU GPLv2 or later

Options

Load at startup

configure



# Determine best epoch

**Antares (Cor Scorpii - Vespertilio - Kalb al Akrab)**  
 **$\alpha$  Sco - 21 Sco - HIP 80763 - SAO 184415 - HD 148478 - HR 6134 - WDS J16294-2626**

Magnitude: 1.05 (reduced to 1.33 by 2.13 Airmasses)  
RA/Dec (J2000.0): 16h29m24.45s/-26°25'55.8"  
Rise: 18h22m  
Transit: 23h03m  
Set: 3h44m

## TODAY:

Rose at 19:34 (3h 45m 0s ago)  
Sets at 2:58 (in 3h 37m 0s)  
Culminated at 23:16 (3m 0s ago) at 15.4 deg.

## THIS YEAR:

Azimuthal grid [Z]  
Largest sun separation: Jun 5 (at 163.1 deg.)  
Nights above horizon: Jan 4 - Jan 26  
Earth, Heraklion, 0 m  
Acronycal rise/set: Jun 18/May 14, Cosmical rise/set: Dec 20/Nov 14,  
Heliacal rise/set: Jan 4/Oct 16.

FOV 60°

17.9 FPS

2022-07-03 23:20:05 UTC+03:00





# Other factors

- Moon
- Satellites
- Weather
- Technical issues



## Other factors

- Moon
- Satellites
- Weather
- Technical issues

**Ok, I planned, now what?**

# Register for the Faulkes Telescope Project



The screenshot shows the homepage of the Faulkes Telescope Project. At the top, the logo features a stylized telescope and the text 'FAULKES TELESCOPE PROJECT'. Below the logo is a navigation menu with buttons for 'Observing', 'Resources', 'Showcase', 'Information', 'Projects', 'Support', and 'News'. The main content area is titled 'Our Latest Posts' and contains ten article thumbnails with titles such as 'FT goes to the Canaries', 'German teachers capture beautiful views of the Universe', 'Calling All Teachers - Greece is the Word!', 'The best telescope I have looked through', 'Fred Alke and the Faulkes Telescopes', 'Checking Your Time Allocation', 'Tour the Universe live with the Faulkes Telescope Project!', 'Christmas comes early for Welsh school children as their names feature in study of a mysterious hybrid comet/asteroid!', '3rd Shaw-IAU Workshop on Astronomy For Education', and 'Pallas' Parallax!'. Below the posts are three columns: 'WHO ARE WE?' with a 'Find out more' button, 'LOGIN OR REGISTER' with 'Login' and 'Register' buttons (circled in red), and 'WHAT DO WE OFFER?' with a 'Find out more' button. At the bottom, there are three sections: 'MONTHLY TARGETS', 'EDUCATIONAL RESOURCES', and 'IMAGE GALLERY'.

<http://www.faulkes-telescope.com/>

# Requesting Images using the LCO Interface



**LCO Observation Portal** Home Submit Observation Manage Proposals Planning Tools Help Basic Mode

## Submitted Observation Requests

[Filter List](#)

User Info State Info #Requests / Pending / Failed / Complete

**No observation requests found.**

[Submit an Observation Request](#)

**Need help?**

[View the documentation](#) or [contact support](#).

Show: 20

### Quick Navigation

- [Submit Observation](#)
- [Manage Proposals](#)
- [Help](#)

### Telescope availability history?

Telescope	-4 days	-3 days	-2 days	-1 day	Today
Siding Spring 0.4m A	5	0	0	0	
Siding Spring 0.4m B	5	39	0	67	
Siding Spring 2m	5	39	0	67	
Siding Spring 1m 1	5	39	0	67	
Siding	5	39	0	67	

<https://observe.lco.global/>



# Image processing with SalsaJ



**EU-HOU** Bringing frontline interactive astronomy to the classroom

<http://www.euhou.net/>

**Forum**

**Important dates**

**Tools**

**News**

- ✦ TAD: the first GLORIA solar telescope
- ✦ Dead-line for EU-HOU 2014 training sessions: 17th September 2013
- ✦ Dead-line for EU-HOU May 2013 training sessions: 16th January 2013
- ✦ Venus transit in Paris, during a EU-HOU training session

**Software**

**Exercises**

**Contact**

**What is EU-HOU ?**

Copyright@EU-HOU - Design Armella Leung - Conception Alexis Janvier - Extension/Webmaster **Yannick Libert**

<http://www.euhou.net/>



# Thank you!

[This Photo](#) by Unknown Author is licensed under [CC BY-SA](#)



This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein. Project No.KA220-SCH-A710136B



Co-funded by the  
Erasmus+ Programme  
of the European Union