

New techniques to schedule observations

EVN through BHTOM

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- ORP project
- WP3 JA2.2: Time-Domain, Multi-Facility & Multi-Frequency access to Research Infrastructure

Black Hole TOM

- Based on TOM toolkit by LCO
- Coordinate follow-up observations for long-term monitoring
- Target priority list
- Expand to radio

The screenshot shows the BHTOM website interface. At the top, there is a navigation bar with the BHTOM logo and links for Targets, Target Grouping, Observatories, and About. The main content area features a large image of a black hole with the title "Black Hole TOM v.1.1". Below the image is a welcome message and a "New features" section listing several updates. On the right side, there are two panels: "Latest Targets" containing a table of target IDs and their last observation dates, and "Latest Comments" showing recent user feedback.

Black Hole TOM v.1.1

(Image courtesy of Ute Kraus.)

Welcome to Black Hole TOM, built using the [TOM Toolkit](#), Github [here](#). To build your own TOM (Target Observation Manager), check out the [getting started guide](#).

The Black Hole TOM is an interface for viewing and sharing observational photometric and spectroscopic data of time-domain targets, and for requesting and managing follow-up observations obtained with a network of telescopes.

New features

- Added a python script for external fits upload: [data upload script](#)
- Added Gaia Alerts errorbars.
- Microlensing model for 5-parameter fit is available in the Target details page.
- Observatory details pages are accessible via the Observatories list.
- 0.5 arcsec matching radius is available for all observatories.
- Delimiter in photometry data csv has been changed to ";" to avoid problems with parsing Observer names.

Latest Targets

ID	Last observation
Gaia22bpl	2023-01-18
Gaia22alz	2023-01-18
Gaia22acc	2023-01-16
Gaia19esp	2023-01-16
Gaia18bmt	2023-01-16
Gaia21flo	2023-01-16
Gaia20cga	2023-01-16
Gaia20bof	2023-01-16
Gaia21fet	2023-01-16
Gaia21cvu	2023-01-16

Latest Comments

- [Gaia20wrm](#) Przemysław J. Mikołajczyk 2022-12-15
Gemini spectrum failed. This is most likely Be star.
- [TC16](#) Lukasz Wyrzykowski 2022-12-06
100 years old light curve from DASCH (Harvard scan) http://dasch.rc.fas.harvard.edu/lightcurve_frame.php?coo=239.87567594413+25.5&nm=1&box=5&source=apass&frameformat=frame&submit=Search
- [TC16](#) Lukasz Wyrzykowski 2022-12-06
This is a variable object which might go explode within 2023 as a nova. It is also being monitored

BHTOM screenshots

BHTOM | Black Hole list

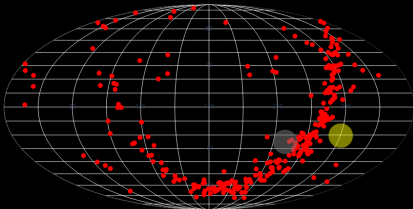
https://bh-tom.astroblabs.pl/bhlist/

BHTOM Targets Target Grouping Observatories About

Bob Eldering Logout

300 Targets [Create Targets](#) [Export Filtered Targets](#)

Target Map (equatorial)



Add/Remove from grouping ROTUZ [Add](#) [Remove](#)

Event Name/Aliases	RA	Dec	Number of Observations	Last Gala [mag]	Target Importance	Time from last obs [days]	Required Cadence [days]	Observing Priority	Sun distance [deg]
TCrB	239.87567594413	25.92017038415	0	None	10.0	2459963.2	0.2	122998158.1	68
BL Cru	185.85830528539	-62.63777452465	0	None	2.0	2459963.2	1.0	4919926.3	
BC0716+714	110.47270122611	71.34343440181	28	None	10.0	841.3	0.0	841252.5	126
LP 944-20	54.89688333333333	-35.428789444444444	0	None	1.0	2459963.2	100.0	24599.6	
SWIFT 1091527	2.0799999999999996	31.323055555555555	0	None	1.0	2459963.2	100.0	24599.6	116
Epsilon Indi B	331.04414583333333	-56.782844166666666	0	None	1.0	2459963.2	100.0	24599.6	54
Gala22crr	214.4055	-58.64501	235	18.05	10.0	109.2	0.3	3641.5	55

BHTOM screenshots

BHTOM | Target AS_270

Targets Target Grouping Observatories About

Bob Eldering [Logout](#)

AS_270

[Update](#) [Delete](#) [Fetch target names](#)

Names	AS_270
Target Type	SIDEREAL
Right Ascension	271.39053826829 18:05:33.729
Declination	-20.3439084574 -20:20:38.070
Epoch	2000.0
Proper Motion (Ra)	-1.256
Proper Motion (Declination)	-9.629
Galactic Longitude	9.70151015102491
Galactic Latitude	0.4239426976352873
gaia_alert_name	
calib_server_name	ivo://AS_270
ztf_alert_name	
aviso_name	
galadr2_id	
TNS_ID	
classification	spectroscopic binary
tweet	False
jdlastobs	2458430.49109954
maglast	
priority	1.0
discovery_date	
cadence	1.0
Sun_separation	9.5
dont_update_me	False

[Survey View](#)

Photometry | [Spectroscopy](#) | [Upload](#) | [Observe](#) | [Observations](#) | [Manage Groups](#) | [Publication](#) | [Data](#)

[Check for new data](#) [Microlensing model](#) [Interactive photometry plot](#)

Photometry

[Download photometry data](#)

Comments

No comments yet.

[Comment](#)

BHTOM screenshots

The screenshot displays the BHTOM web interface for target AS_270. The page is divided into several sections:

- Header:** BHTOM logo, navigation links (Targets, Target Grouping, Observatories, About), and user information (Bob Eldering, Logout).
- Target Information:** A table listing various parameters for AS_270, including names, target type, coordinates, epoch, proper motion, galactic coordinates, and alert server names.
- Observe Section:** Includes buttons for LCO, GEM, and LT, and a section for running an observing strategy with dropdown menus for observing strategy, cadence strategy, and cadence frequency.
- Plan Section:** Includes a 'Run' button and a section for planning observations with input fields for start and end times, and a maximum airmass value.
- Survey View:** A small thumbnail image of the target field.
- Graph:** A plot showing Moon distance (degrees) and Moon phase over time.

Parameter	Value
Names	AS_270
Target Type	SIDEREAL
Right Ascension	271.39053826829 18:05:33.729
Declination	-20.3439084574 -20:20:38.070
Epoch	2000.0
Proper Motion (Ra)	-1.256
Proper Motion (Declination)	-9.629
Galactic Longitude	9.70151015102491
Galactic Latitude	0.4239426976352873
gaia_alert_name	
calib_server_name	ivo://AS_270
ztf_alert_name	
aviso_name	
galadr2_id	
TNS_ID	
classification	spectroscopic binary
tweet	False
jdlastobs	2458430.49109954
maglast	
priority	1.0
discovery_date	
cadence	1.0
Sun_separation	9.5
dont_update_me	False

TOM EVN module

The screenshot displays the TOM Toolkit interface for target M31. The browser address bar shows 'localhost:8080/targets/2/'. The navigation bar includes 'Home', 'Targets', 'Alerts', 'Observations', 'Data', and 'Users', with a 'Logout' button in the top right.

M31

3 upcoming observations

There are 0 observations with unknown status

[Update Target](#) [Delete Target](#)

Names	M31
Target Type	SIDEREAL
Right Ascension	10 6847 00:42:44.330
Declination	41 2687 +41:16:7.500

Tags

Recent Photometry

Timestamp	Magnitude
No recent photometry	

Survey View

J2000 00 42 44.330 +41 16 7.500

Observe

Observe Observations Manage Data Manage Groups Photometry

Spectroscopy

Observe

[LCD](#) [GEM](#) [SOAR](#) [LT](#) [EVN](#)

Apply an observation template

Observation template*

Cadence strategy

[Apply](#)

Plan

Start Time
mm / dd / yyyy

End Time
mm / dd / yyyy

Maximum Airmass
Maximum Airmass

[Plan](#)

Figure: A line graph showing Moon distance (degrees) and Moon phase over time. The x-axis represents time, and the y-axis represents values from 90 to 180. The blue line represents Moon distance (degrees), and the red line represents Moon phase. The Moon phase curve shows a full moon (1.0) and a new moon (0.0). The Moon distance curve shows a maximum distance of approximately 180 degrees and a minimum of approximately 90 degrees.

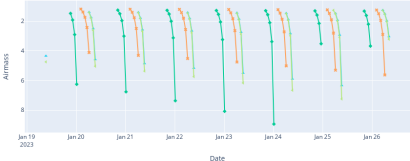
TOM EVN module

TOM Toolkit | Submit Ob: x

localhost:8080/observations/EVN/create/?target_id=2

TOM Toolkit Home Targets Alerts Observations Data Users eJdering Logout

Submit an observation to EVN

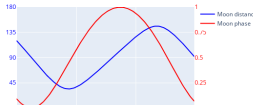


Legend for Airmass graph:

- (LCO) Siding Spring
- (LCO) Sutherland
- (LCO) Teide
- (LCO) Cerro Tololo
- (LCO) McDonald
- (LCO) Haleakala
- (GEM) Cerro Pachón
- (GEM) Maunakea
- (SOAR) Cerro Pachón

Names: M31
Target Type: SIDEREAL
Right Ascension: 10 6847
Declination: 41 2687
+41.167.500

Tags: Lunar Distance



Legend for Lunar Distance graph:

- Moon distance (degrees)
- Moon phase

Imaging

Band*
21 cm or 1.4 GHz

Stations*
 Tonin
 Yebes

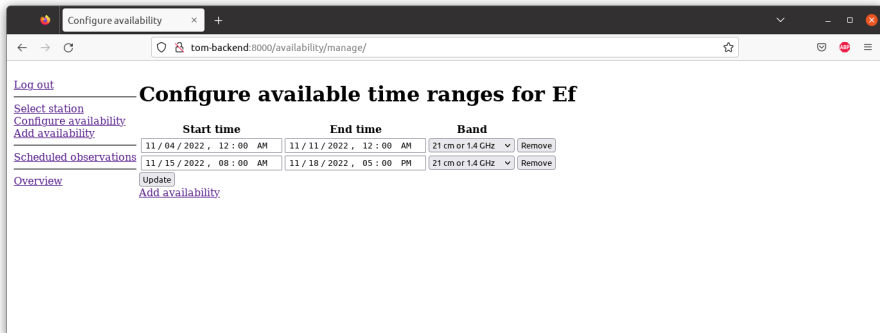
Start time*
01 / 20 / 2023 , 12 : 00 PM

End time*
01 / 20 / 2023 , 04 : 00 PM

Check station availability

Submit Back

Backend: telescope time

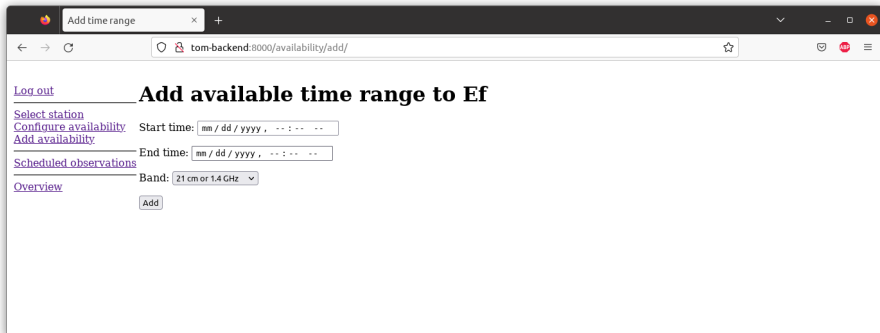


The screenshot shows a web browser window with the address bar displaying `tom-backend:8000/availability/manage/`. The page title is "Configure available time ranges for Ef". On the left side, there are several navigation links: "Log out", "Select station", "Configure availability", "Add availability", "Scheduled observations", and "Overview". The main content area features a table with the following structure:

Start time	End time	Band	
11 / 04 / 2022 , 12 : 00 AM	11 / 11 / 2022 , 12 : 00 AM	21 cm or 1.4 GHz	Remove
11 / 15 / 2022 , 08 : 00 AM	11 / 18 / 2022 , 05 : 00 PM	21 cm or 1.4 GHz	Remove

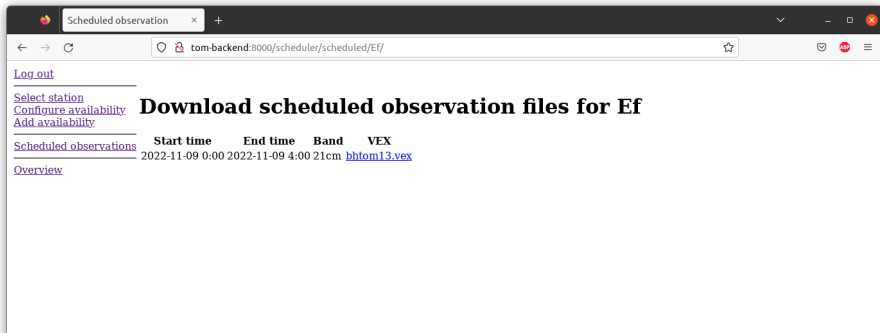
Below the table, there is an "Update" button and a link to "Add availability".

Backend: telescope time



The screenshot shows a web browser window with the address bar containing 'tom-backend:8000/availability/add/'. The page title is 'Add available time range to Ef'. On the left side, there is a navigation menu with links: 'Log out', 'Select station', 'Configure availability', 'Add availability', 'Scheduled observations', and 'Overview'. The main content area contains a form with the following fields and controls:

- Start time:** A text input field with a placeholder 'mm / dd / yyyy , -- : -- --'.
- End time:** A text input field with a placeholder 'mm / dd / yyyy , -- : -- --'.
- Band:** A dropdown menu currently showing '21 cm or 1.4 GHz'.
- Add:** A button located below the band dropdown.



Scheduled observation

tom-backend:8000/scheduler/scheduled/Ef/

[Log out](#)

[Select station](#) [Configure availability](#) [Add availability](#)

Download scheduled observation files for Ef

[Scheduled observations](#)

Start time	End time	Band	VEX
2022-11-09 0:00	2022-11-09 4:00	21cm	bhtom13.vex

[Overview](#)

Backend: overview

Availability overview

[Log out](#)

[Select station](#)

[Configure availability](#)

[Add availability](#)

[Scheduled observations](#)

[Overview](#)

Band: 21 cm or 1.4 GHz

Effelsberg	Free		bh	Free				
Medicina		Free		bh	Free			
	Mon 7	Tue 8	Wed 9	Thu 10	Fri 11	S		
	November 2022							

Use the mouse scroll wheel to zoom the displayed time range in or out and the drag with the left mouse button to change the time displayed.

- <https://tom-backend.jive.eu/>
- What kind of science?
- How much automation?
- What time allocation schemes work for which stations?