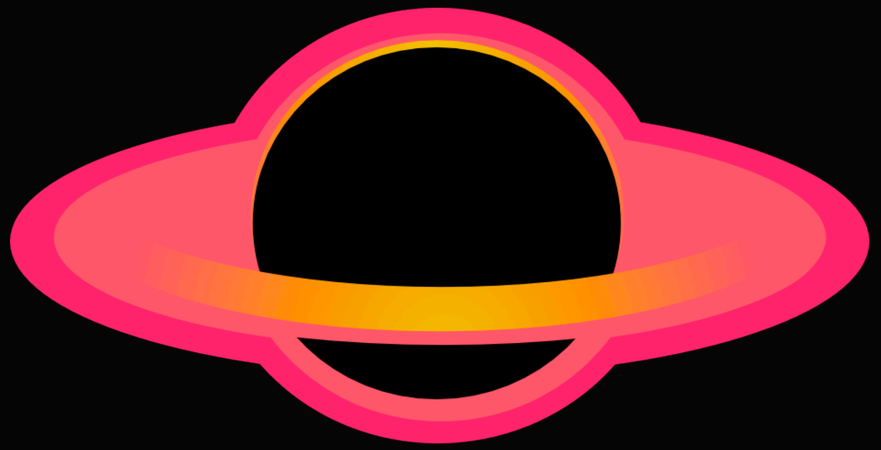

bhtom2

visual manual
2025 September 30

TOM TOOLKIT Las Cumbres Observatory

///AkondLab.

UNIVERSITAS VARSOVIENSIS

NCBJ

UNIVERSITY OF CAMBRIDGE

OPTICON

OPTICON RadioNet Pilot

European ACME

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Warsaw University Astronomical Observatory


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Funding:

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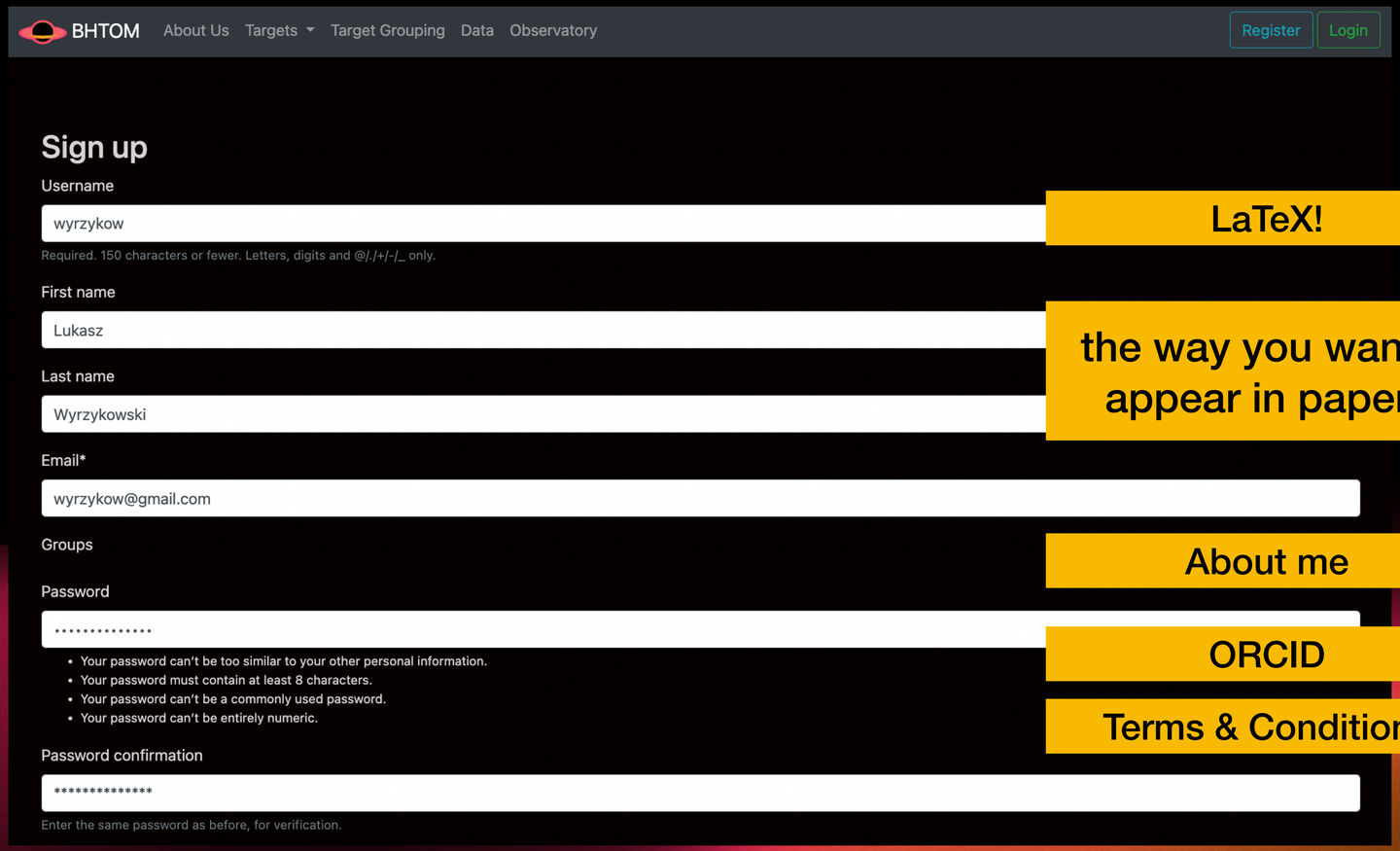
registration



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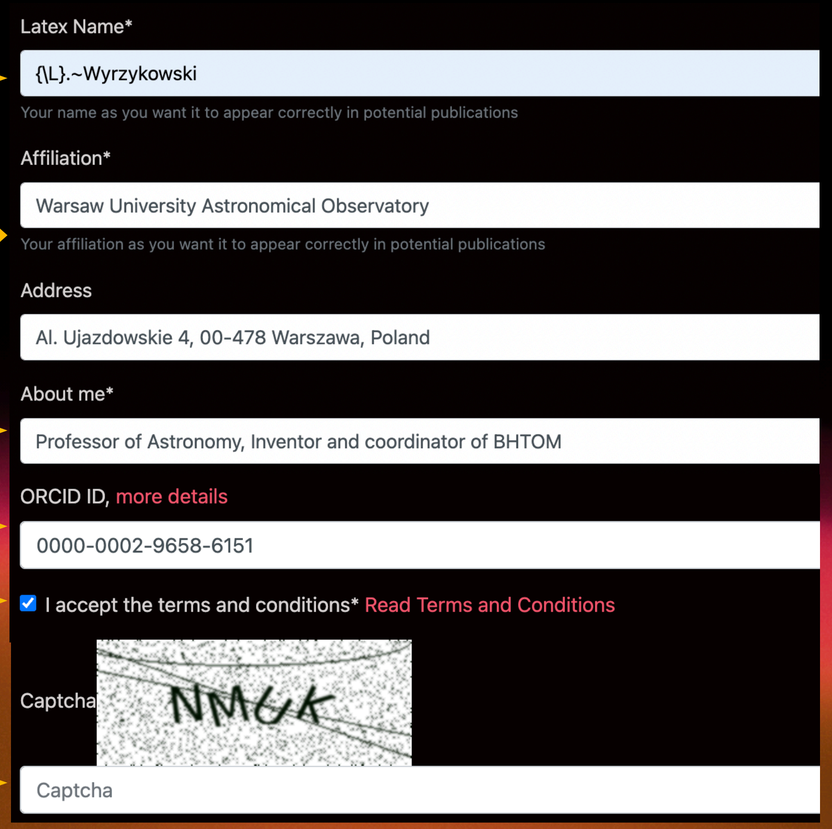

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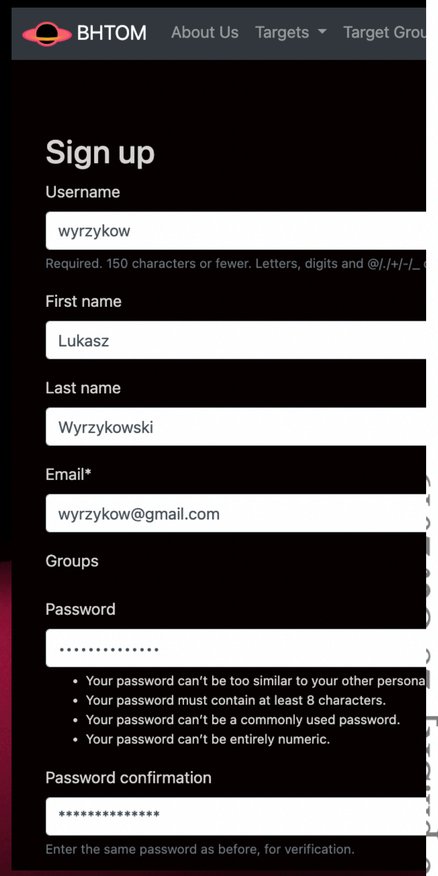

Astronomy & Astrophysics manuscript no. pap16aye
October 30, 2019
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Full orbital solution for the binary system in the northern Galactic disc microlensing event Gaia16aye★

Łukasz Wyrzykowski[1,★★], P. Mróz[1], K. A. Rybicki[1], M. Gromadzki[1], Z. Kołaczkowski[45,79,★★★], M. Zieliński[1], P. Zieliński[1], N. Britavskiy[4,5], A. Gomboc[35], K. Sokolovsky[19,3,66], S.T. Hodgkin[6], L. Abe[89], G.F. Aldi[20,80], A. AlMannaei[62,100], G. Altavilla[72,7], A. Al Qasim[62,100], G.C. Anupama[8], S. Awiphan[9], E. Bachelet[63], V. Bakış[10], S. Baker[100], S. Bartlett[50], P. Bendjoya[11], K. Benson[100], I.F. Bikmaev[76,87], G. Birenbaum[12], N. Blagorodnova[24], S. Blanco-Cuaresma[15,74], S. Boeva[16], A.Z. Bonanos[19], V. Bozza[20,80], D.M. Bramich[62], I. Bruni[25], R.A. Burenin[84,85], U. Burgaz[21], T. Butterley[22], H. E. Caines[34], D. B. Caton[93], S. Calchi Novati[83], J.M. Carrasco[23], A. Cassan[29], V. Čepas[56], M. Cropper[100], M. Chruślińska[1,24], G. Clementini[25], A. Clerici[35], D. Conti[91], M. Conti[48], S. Cross[63], F. Cusano[25], G. Damljanovic[26], A. Dapergolas[19], G. D'Ago[81], J. H. J. de Bruijne[27], M. Dennefeld[29], V. S. Dhillon[30,4], M. Dominik[31], J. Dziedzic[1], O. Erece[32], M. V. Eselevich[86], H. Esenoglu[33], L. Eyer[74], R. Figuera Jaimes[31,53], S. J. Fossey[34], A. I. Galeev[76,87], S. A. Grebenev[84], A. C. Gupta[99], A. G. Gutaev[76], N. Hallakoun[12], A. Hamanowicz[1,36], C. Han[2], B. Handzlik[37], J. B. Haislip[94], L. Hanlon[102], L. K. Hardy[30], D. L. Harrison[6,88], H.J. van Heerden[103], V. L. Hoette[95], K. Horne[31], R. Hudec[39,76,40], M. Hundertmark[41], N. Ihanec[35], E. N. Irtuganov[76,87], R. Itoh[43], P. Iwanek[1], M.D.Jovanovic[26], R. Janulis[56], M. Jelínek[39], E. Jensen[92], Z. Kaczmarek[1], D. Katz[101], I.M. Khamitov[44,76], Y.Kilic[32], J. Klencki[1,24], U. Kolb[47], G. Kopacki[45], V. V. Kouprianov[94], K. Kruszyńska[1], S. Kurowski[37], G. Latev[16], C-H. Lee[17,18], S. Leonini[48], G. Leto[49], F. Lewis[50,59], Z. Li[63], A. Liakos[19], S. P. Littlefair[30], J. Lu[51], C.J. Manser[52], S. Mao[53], D. Maoz[12], A.Martin-Carrillo[102], J. P. Marais[103], M. Maskoliūnas[56], J. R. Maund[30], P. J. Meintjes[103], S. S. Melnikov[76,87], K. Ment[41], P. Mikołajczyk[45], M. Morrell[47], N. Mowlavi[74], D. Moździerski[45], D. Murphy[102], S. Nazarov[90], H. Netzel[1,79], R. Nesci[67], C.-C. Ngeow[54], A. J. Norton[47], E. O. Ofek[55], E. Pakštienė[56], L. Palaversa[6,74], A. Pandey[99], E. Paraskeva[19,78], M. Pawlak[1,65], M. T. Penny[57], B. E. Penprase[58], A. Piascik[59], J. L. Prieto[96,97], J. K. T. Qvam[98], C. Ranc[70], A. Rebassa-Mansergas[60,71], D. E. Reichart[94], P. Reig[61,75], L. Rhodes[30], J.-P. Rivet[89], G. Rixon[6], D. Roberts[47], P. Rosi[48], D.M. Russell[62], R. Zanmar Sanchez[49], G. Scarpetta[20,82], G. Seabroke[100], B. J. Shappee[69], R. Schmidt[41], Y. Shvartzvald[13,14], M. Sitek[1], J. Skowron[1], M. Śniegowska[1,77,79], C. Snodgrass[46], P. S. Soares[34], B. van Soelen[103], Z. T. Spetsieri[19,78], A. Stankevičiūtė[1], I. A. Steele[59], R. A. Street[63], J. Strobl[39], E. Strubble[95], H. Szegedi[103], L. M. Tinjaca Ramirez[48], L. Tomasella[64], Y. Tsapras[41], D. Vernet[11], S. Villanueva Jr.[57], O. Vince[26], J. Wambsganss[41,42], I. P. van der Westhuizen[103], K. Wiersema[52,68], D. Wium[103], R. W. Wilson[22], A. Yoldas[6], R.Ya. Zhuchkov[76,87], D. G. Zhukov[76], J. Zdanavičius[56], S. Zoła[37,38], and A. Zubareva[73,3]

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BHTOM2

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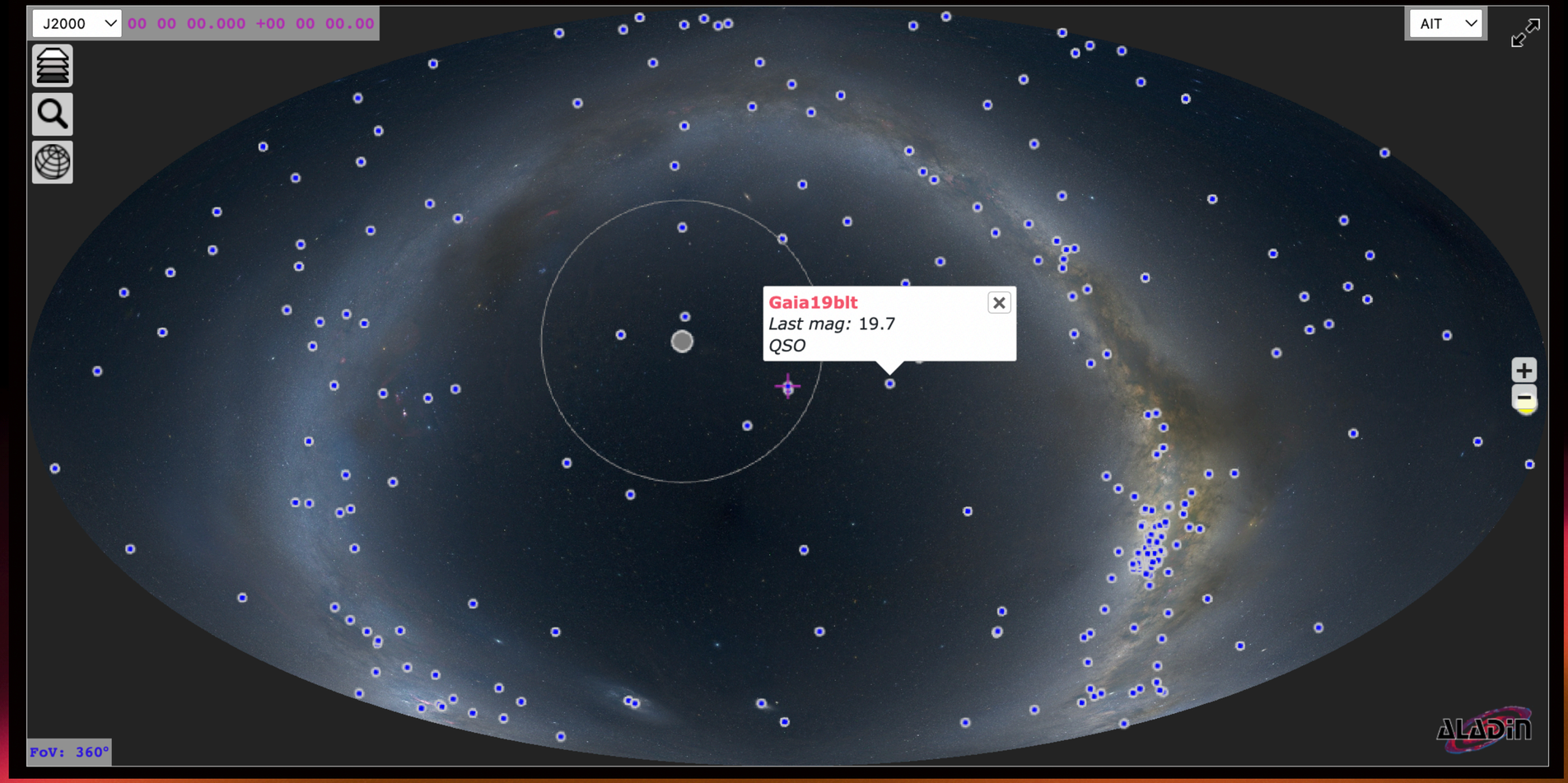
BHTOM2

target lists

- Aladin map
- default: Mellinger
- equatorial-galactic
- interactive
- Moon
- Sun
- other wavelengths
- grid

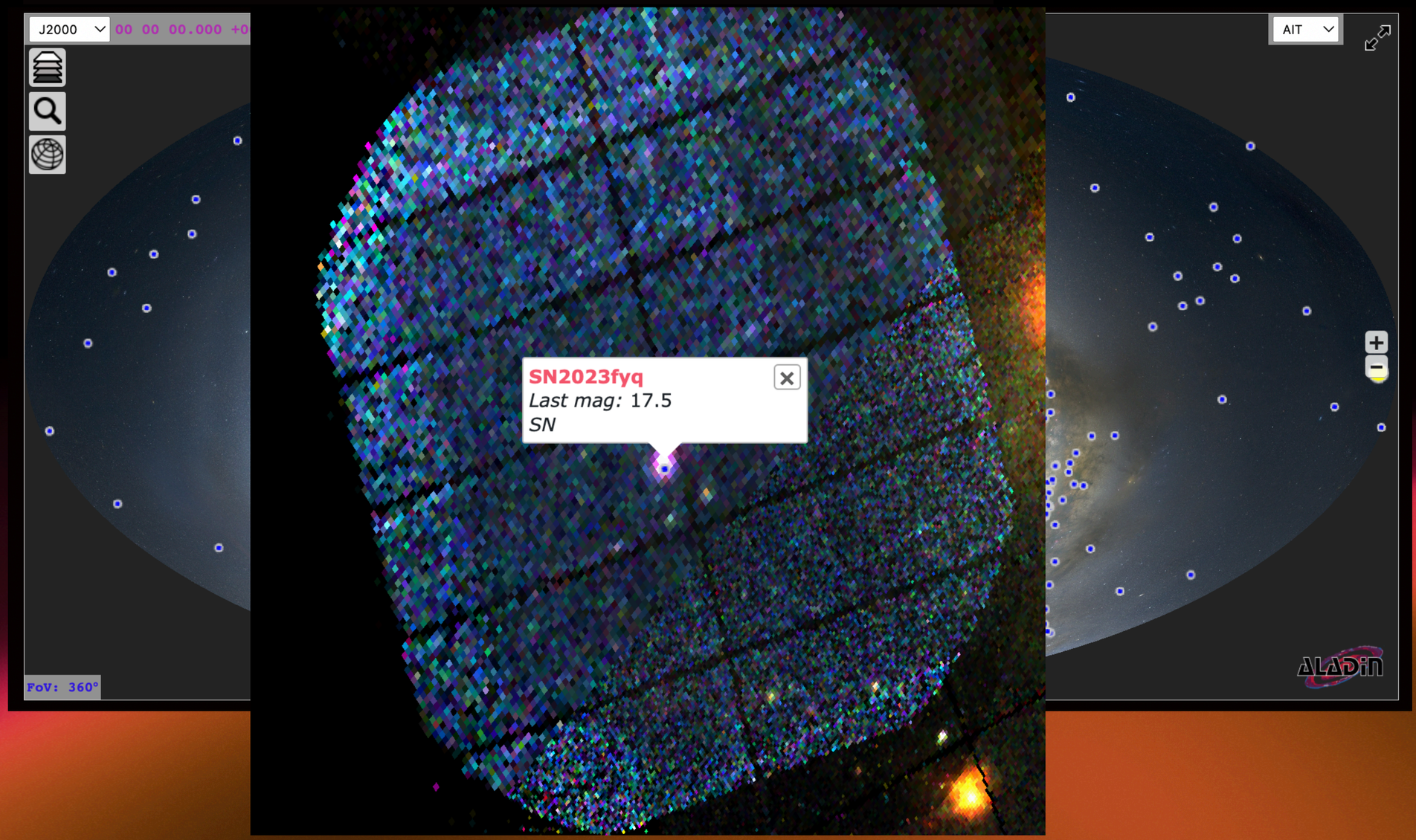
Warning: Default filter applied. Showing targets with Importance>0 only



BHTOM2

target lists

- Aladin map
- default: Mellinger
- equatorial-galactic
- interactive
- Moon
- Sun
- other wavelengths
- grid



BHTOM2

target lists

Add/Remove from grouping [ ] Add Move Remove

Show 10 entries

	Names	RA	Dec	Nobs	Last Gmag	Last Filter	Importance	Created	Priority	Sun	Class
☐	Gaia22bpl	10:38:42.425	-61:15:49.680	903	12.7	Gaia/r	9.99	2023-10-01 06:10:13	336.7	62	Microlensing Event
☐	Gaia23cpd	19:10:08.822	-04:43:14.736	1810	15.1	Gaia/r	9.99	2023-10-01 18:10:29	91.6	100	Unknown
☐	Gaia23bay	19:49:42.996	+10:43:41.448	1953	13.8	Gaia/r	9.99	2023-10-01 19:10:47	46.8	110	Unknown
☐	Gaia22bra	19:50:00.876	+26:29:07.908	2150	15.7	Gaia/r	9.99	2023-10-01 17:10:22	23.6	109	Unknown
☐	Gaia23cnu	18:56:25.440	-18:04:50.880	1364	15.4	Gaia/r	9.99	2023-10-01 18:10:28	121.6	95	Unknown
☐	Gaia21fkl	07:46:28.378	-21:52:32.016	1380	15.8	Gaia/r	9.99	2023-10-01 08:10:18	32.6	71	Unknown
☐	Gaia22dkv	10:07:04.555	-66:10:51.204	1304	13.2	Gaia/r	9.99	2023-10-01 09:10:52	335.3	68	Unknown
☐	Gaia23cnw	18:29:59.232	-14:02:27.564	265	17.7	Gaia/r	9.99	2023-10-01 18:10:28	126.6	89	Unknown
☐	Gaia23cqh	19:08:36.578	+11:08:30.552	1406	17.0	Gaia/r	9.99	2023-10-01 18:10:29	66.5	100	Unknown

Showing 1 to 9 of 9 entries

Previous 1 Next

BHTOM2

target lists

target groupings

Add/Remove from grouping [ ] Add Move Remove

Show 10 entries

sortable columns

	Names	RA	Dec	Nobs	Last Gmag	Last Filter	Importance	Created	Priority	Sun	Class
☐	Gaia22bpl	10:38:42.425	-61:15:49.680	903	12.7	Gaia/r	9.99				Microlensing Event
☐	Gaia23cpd	19:10:08.822	-04:43:14.736	1810	15.1	Gaia/r	9.99	2023-10-01 18:10:29	91.6	100	Unknown
☐	Gaia23bay	19:49:42.996	+10:43:41.448	1953	13.8	Gaia/r	9.99	2023-10-01 19:10:47	46.8	110	Unknown
☐	Gaia22bra	19:50:00.876	+26:29:07.908	2150	15.7	Gaia/r	9.99	2023-10-01 17:10:22	23.6	109	Unknown
☐	Gaia23cnu	18:56:25.440	-18:04:50.880	1364	15.4	Gaia/r	9.99	2023-10-01 18:10:28	121.6	95	Unknown
☐	Gaia21fkl	07:46:28.378	-21:52:32.016	1380	15.8	Gaia/r	9.99	2023-10-01 08:10:18	32.6	71	Unknown
☐	Gaia22dky	10:07:04.555	-66:10:51.204	804	13.2	Gaia/r	9.99	2023-10-01 09:10:52	335.3	68	Unknown
☐					17.7	Gaia/r	9.99	2023-10-01 18:10:28	126.6	89	Unknown
☐	Gaia23cqn	19:08:36.578	+11:08:30.552	06	17.0	Gaia/r	9.99	2023-10-01 18:10:29	66.5	100	Unknown

class as enum

last magnitude calibrated roughly to Gaia even if no Gaia G available (uses all but WISE bands)

Showing 1 to 9 of 9 entries

Previous 1 Next

BHTOM2

target lists - filtering example

RA (0,360)

min	RA (0,360)
max	RA (0,360)

Dec (-90,90)

min	0
max	Dec (-90,90)

North only

Importance (0,10)

min	4
max	Importance (0,10)

Importance>4

Sun separation (0,360)

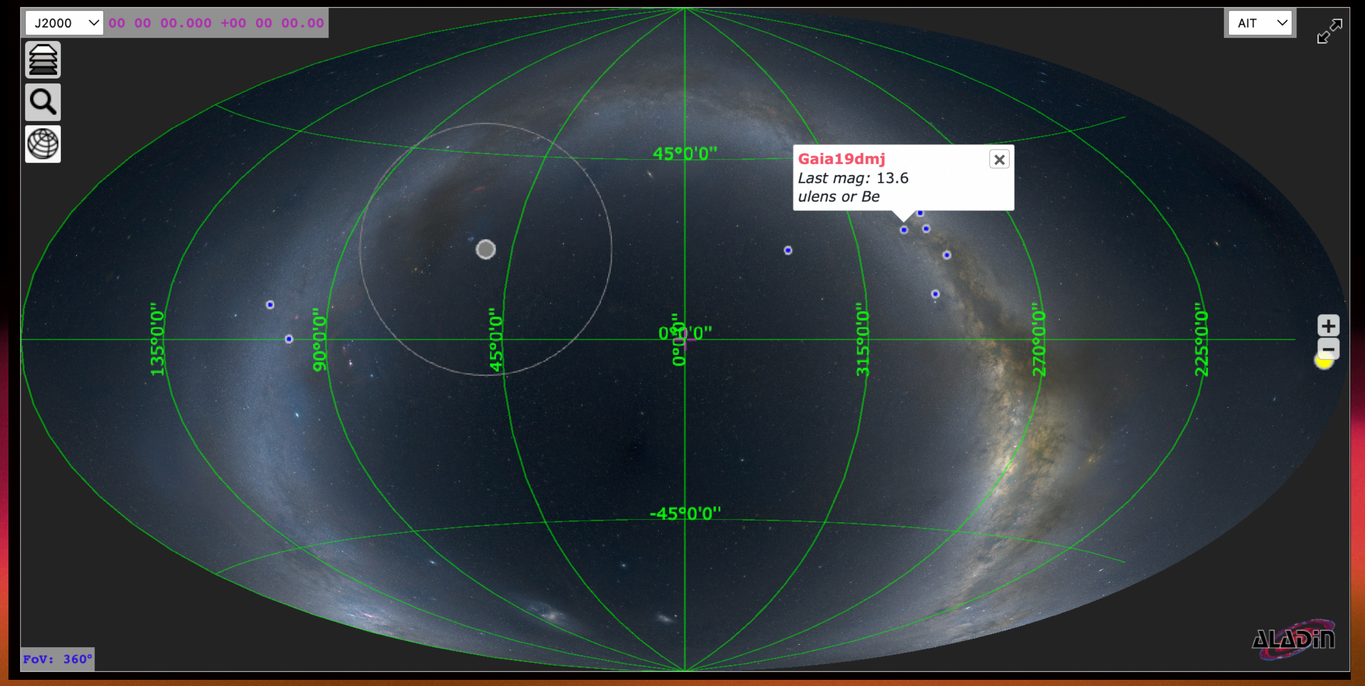
min	60
max	Sun separation (0,360)

visible now

Last G magnitude

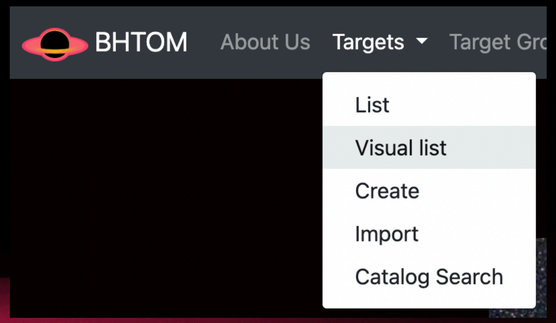
min	Last G magnitude
max	18

not fainter than 18 mag



BHTOM2

target visual list



define your filter first

Name

Name

Key

Key

Value

Value

Cone Search

Cone Search

RA, Dec, Search Radius (degrees)

Target Grouping

Cone Search (Target)

Cone Search (Target)

Target Name, Search Radius (degrees)

RA

min RA

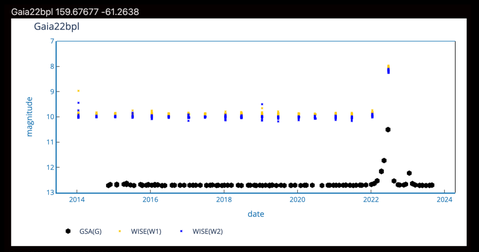
max RA

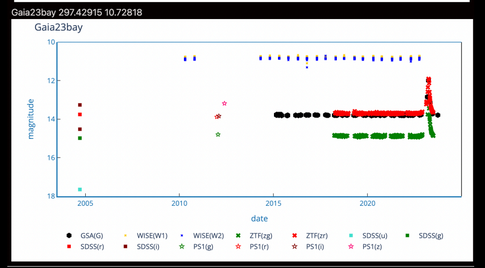
Dec

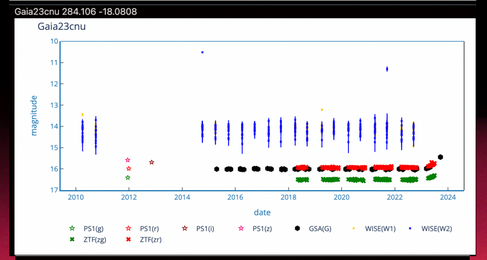
min Dec

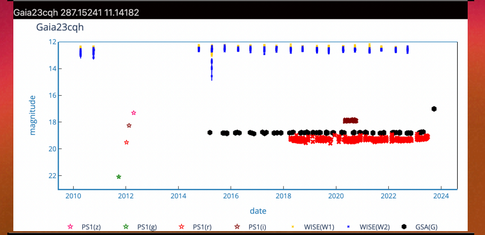
max Dec

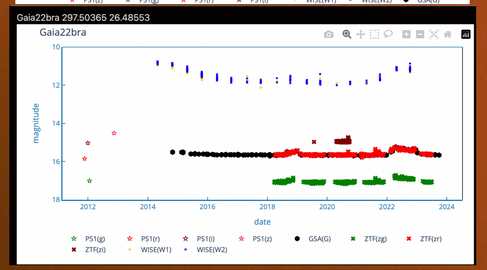
Filter Reset











interactive plots
click links to detail

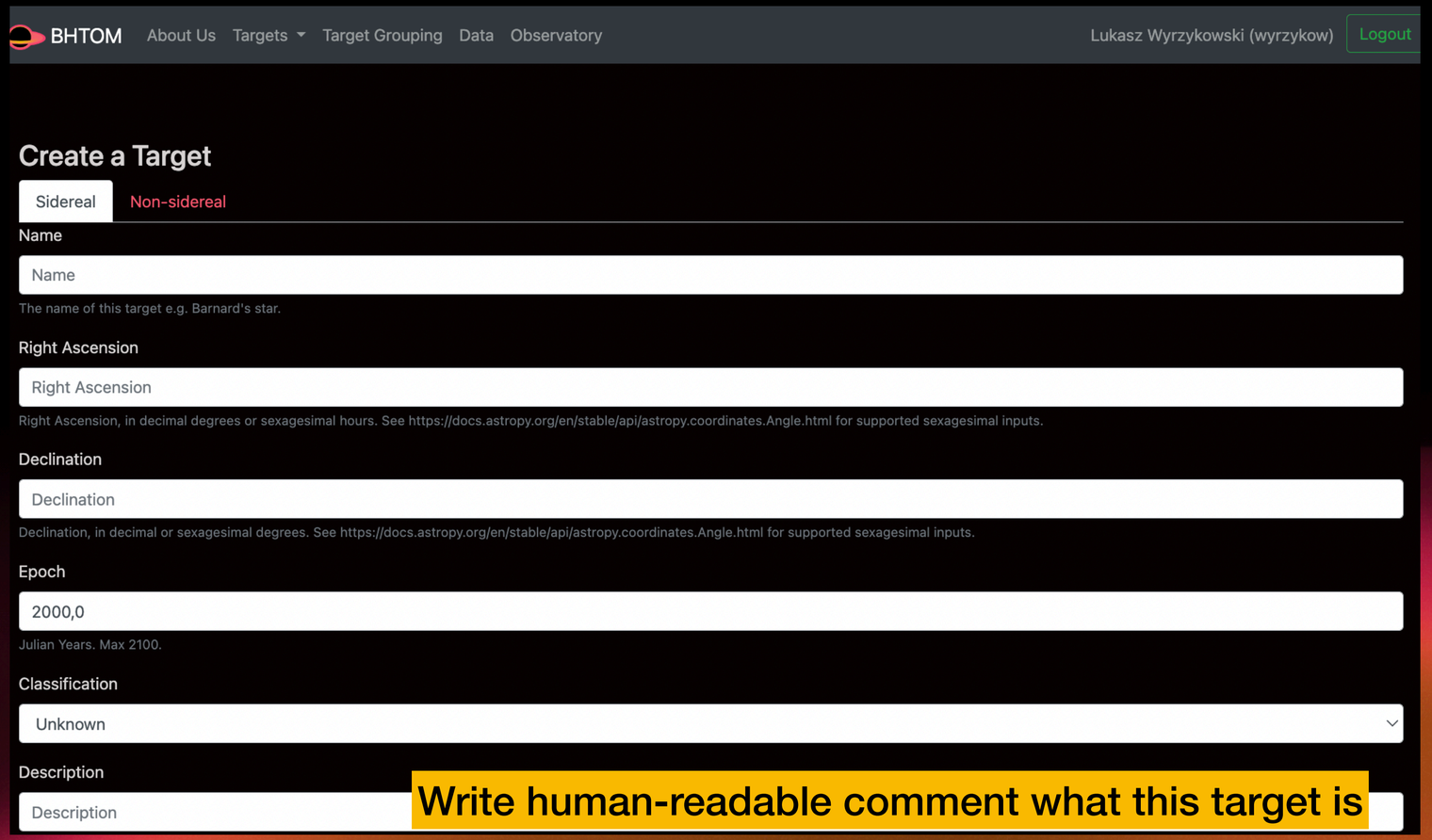
target create

- Create manually
- Import
- Catalog search

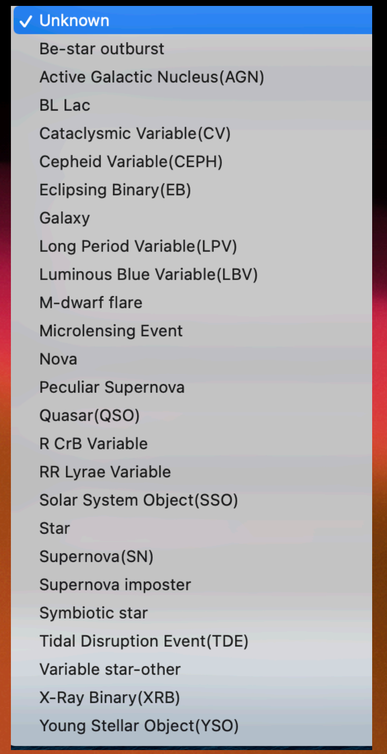
BHTOM2

target create

- Create manually
- Import
- Catalog search



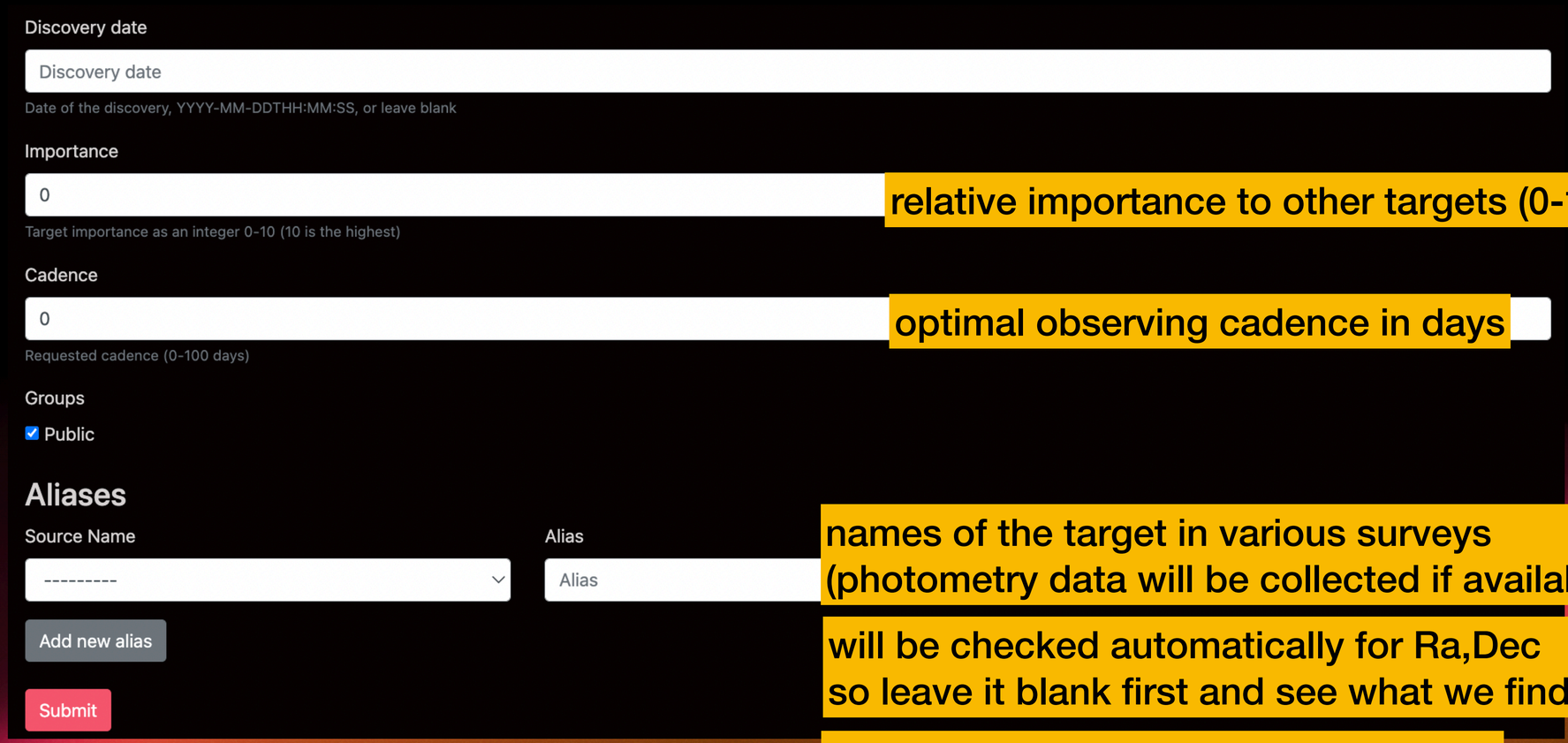
classification types

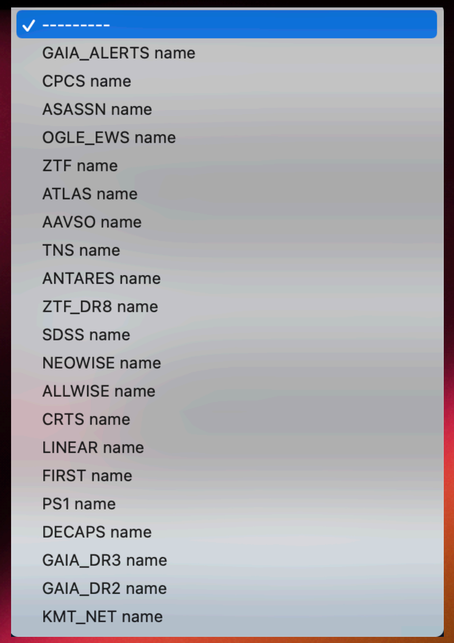


BHTOM2

target create

- Create manually
- Import
- Catalog search





BHTOM2

target create — import

- powerful tool!
- use with caution!
- important: correct headers in CSV files (case sensitive!)
- special case for Gaia Alerts

all targets from this import will be added to this group

Import Targets

If you want to add all imported targets to a new group, please fill in the "Group name" field (optional).

Upload a .csv to import targets in bulk.

Allowed field names:

```
name, ra, dec, epoch, parallax, pm_ra, pm_dec, distance, distance_err,
classification, description, discovery_date, importance, cadence, phot_class,
description, epoch_of_elements, mean_anomaly, arg_of_perihelion, eccentricity,
lng_asc_node, inclination, mean_daily_motion, semimajor_axis, epoch_of_perihelion,
ephemeris_period, ephemeris_period_err, ephemeris_epoch, ephemeris_epoch_err, perihdist
```

List of available classifications:

```
Be-star outburst, AGN, BL Lac, CV, CEPH, EB, Galaxy, LPV, LBV, M-dwarf flare,
Microlensing Event, Nova, Peculiar Supernova, QSO, RCrB, RR Lyrae Variable,
SSO, Star, SN, Supernova imposter, Symbiotic star, TDE, Variable star-other,
XRB, YSO
```

CSV file format examples:

```
name,       type,       ra,         dec,        redshift,   distance,   classification, description
mytarget,   SIDERAL,    123.12,     -12.34,     2.35,       1.0         Star            nice supernova
```

```
name,       ra,         dec,     importance, cadence
mytarget,   123.12,     -12.34,  5,          1
```

```
name,       GAIA_ALERTS_name
mytarget,   Gaia20dup
```

```
name,       GAIA_ALERTS_name,   cadence
mytarget,   Gaia20dup,          3
```

In these special cases, the Gaia Alerts harvester will gather all information from Gaia Alerts, but any extra columns in the CSV file with corresponding fields will replace those read from Gaia Alerts.

You can upload max 500 targets.

Group Name (optional):

Choose file No file chosen

Upload

BHTOM2

target create — catalog search

Search Catalogs for a Target

Term

Gaia19axp

Service

- ✓ Gaia Alerts
- ANTARES
- OGLE EWS
- TNS
- NED
- Simbad

Search Catalogs for a Target

Term

SN2023ixf

Service

TNS

search

Create a Target

Sidereal | Non-sidereal

Name

Gaia19axp

The name of this target e.g. Barnard's star.

Right Ascension

216.94333

Right Ascension, in decimal degrees or sexagesimal hours. See https://docs.astropy.org/en/stable/api/astropy.coordinates.Angle.html for supported sexagesimal inputs.

pre-filled fields

Declination

29.51063

Declination, in decimal or sexagesimal degrees. See https://docs.astropy.org/en/stable/api/astropy.coordinates.Angle.html for supported sexagesimal inputs.

pre-filled fields

Epoch

2000

Julian Years. Max 2100.

Classification

Quasar(QSO)

pre-filled fields

Description

QSO with little prior variability in Gaia brightens by 1 mag. SDSS spectrum.

pre-filled fields

Discovery date

2019-03-10 14:27:41

Date of the discovery, YYYY-MM-DDTHH:MM:SS, or leave blank

pre-filled fields

Importance

9,99

Target importance as an integer 0-10 (10 is the highest)

importance set to 9.99, but should be edited

Cadence

1,0

Requested cadence (0-100 days)

cadence set to 1, but should be edited

target create

BHTOM2

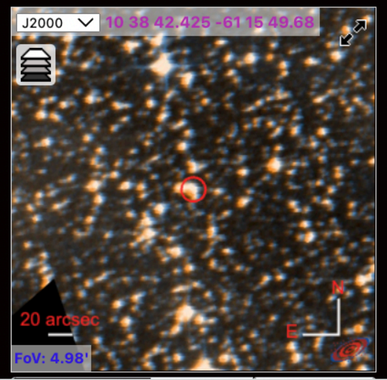
Target created, grabbing all the data for it. Please wait and refresh in about a minute... ×

Gaia22bpl

Update Target | Delete Target

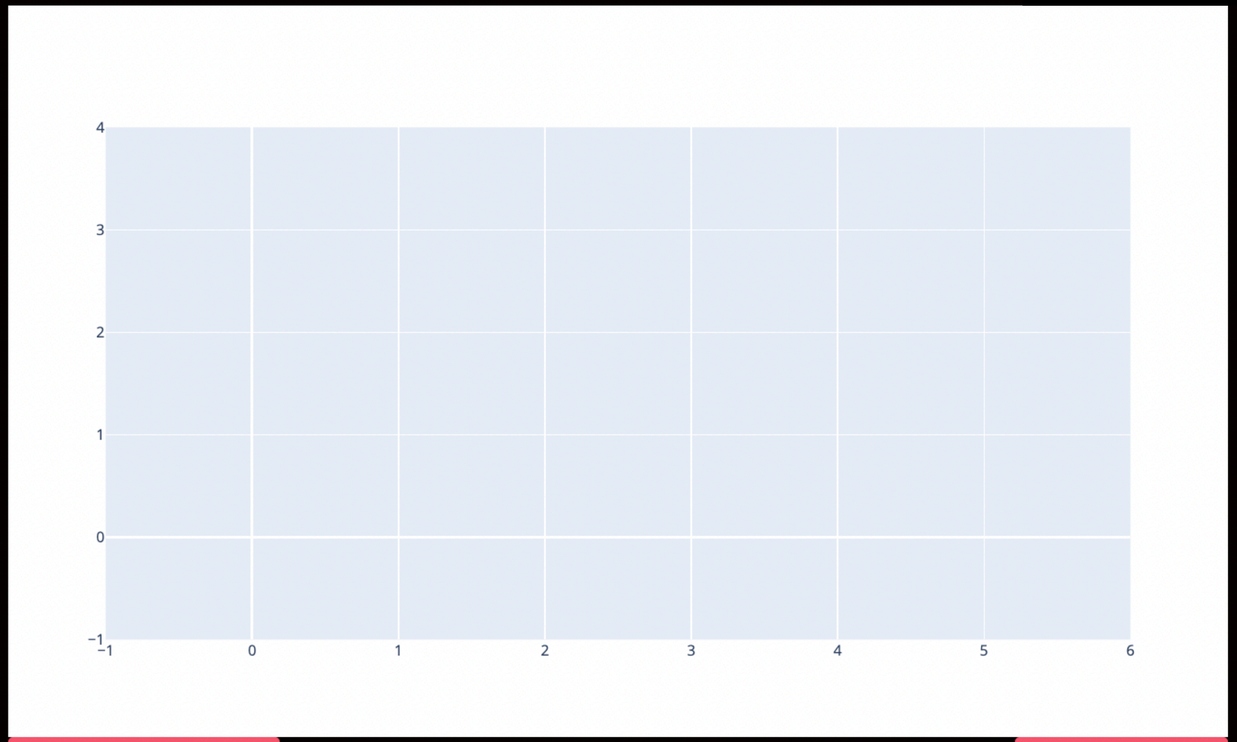
Name	Gaia22bpl
Right Ascension	159.67677 10:38:42.425
Declination	-61.2638 -61:15:49.680
Epoch	2000.0
Discovered	2022-04-14 01:04:50
Class	Unknown
Target importance (0-10)	9.99
Cadence requested (d)	1.0

Other names:



Photometry | Models | Spectroscopy | Observe | Observations | Publication | Manage Data | Manage Groups

Photometry



Download photometry data | Download radio data

Recent Photometry

Timestamp	Magnitude	Filter	Facility

target page

DIRECT ACCESS via name: https://bh-tom2.astrolabs.pl/targets/Gaia22bpl/

BHTOM2

Gaia22bpl

Update Target | Delete Target

Name	Gaia22bpl
Right Ascension	159.67677 10:38:42.425
Declination	-61.2638 -61:15:49.680
Epoch	2000.0
Galactic Longitude	287.662164
Galactic Latitude	-2.390806
Constellation	Carina
Discovered	2022-04-14 01:04:50
Class	Microlensing Event
Phot.Class	Ulens Candidate 100.0%
Last MJD	60184.56631
Last G Mag	12.7
Target importance (0-10)	9.99
Cadence requested (d)	1.0
Observing priority	330.0
Sun Separation (deg)	62.0

Other names:

GAIA_ALERTS
Gaia22bpl

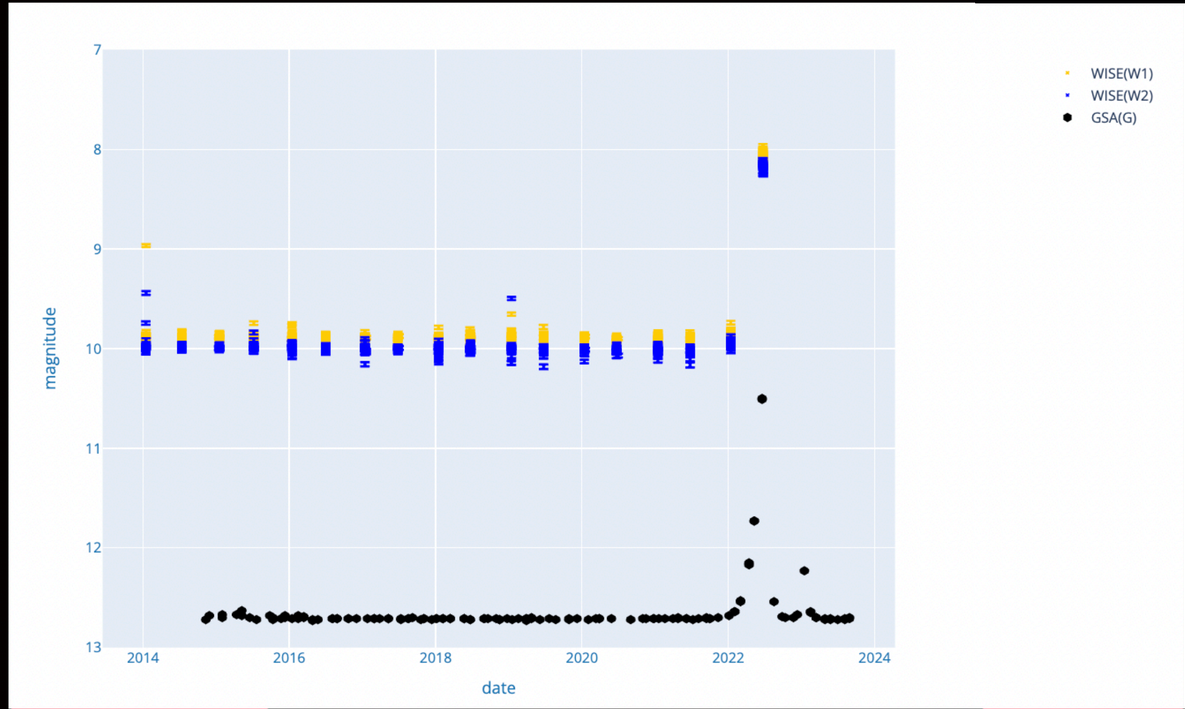
GAIA_DR3
5254100872645875968

NEOWISE
NEOWISE+J159.67677_-61.2638

CRTS
CRTS+J159.67677_-61.2638

Photometry | Models | Spectroscopy | Observe | Observations | Publication | Manage Data | Manage Groups

Photometry



Download photometry data | Download radio data

Recent Photometry

Timestamp	Magnitude	Filter	Facility
2023-08-28 13:08:29	12.7100	GSA(G)	Gaia Alerts
2023-08-28 11:08:54	12.7000	GSA(G)	Gaia Alerts
2023-08-05 13:08:59	12.7200	GSA(G)	Gaia Alerts
2023-08-05 11:08:24	12.7100	GSA(G)	Gaia Alerts
2023-07-01 00:07:48	12.7200	GSA(G)	Gaia Alerts

target page
no login required

PUBLIC LINK: https://bhtom.space/public/targets/Gaia22bpl/

BHTOM2

Gaia22bpl

Update Target | Delete Target

Name	Gaia22bpl
Right Ascension	159.67677 10:38:42.425
Declination	-61.2638 -61:15:49.680
Epoch	2000.0
Galactic Longitude	287.662164
Galactic Latitude	-2.390806
Constellation	Carina
Discovered	2022-04-14 01:04:50
Class	Microlensing Event
Phot.Class	Ulens Candidate 100.0%
Last MJD	60184.56631
Last G Mag	12.7
Target importance (0-10)	9.99
Cadence requested (d)	1.0
Observing priority	330.0
Sun Separation (deg)	62.0

Other names:

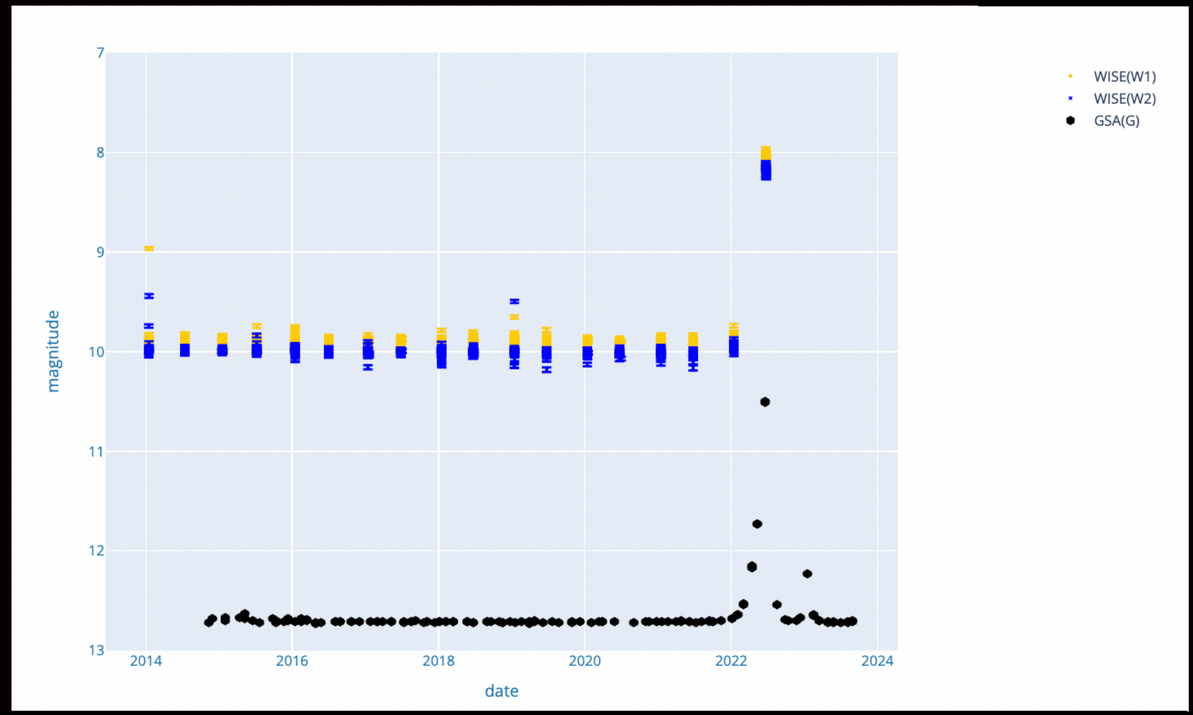
GAIA_ALERTS
Gaia22bpl

GAIA_DR3

CRTS+J159.67677_-61.2638

Photometry | Publication

Photometry



no download

Recent Photometry

Timestamp	Magnitude	Filter	Facility
2023-08-28 13:08:29	12.7100	GSA(G)	Gaia Alerts
2023-08-28 11:08:54	12.7000	GSA(G)	Gaia Alerts
2023-07-01 00:07:48	12.7200	GSA(G)	Gaia Alerts

Always use the public link when sharing or publishing

BHTOM2

target detail

Gaia22bpl

Update Target | Delete Target

Name	Gaia22bpl
Right Ascension	159.67677
	10:38:42.425
Declination	-61.2638
	-61:15:49.680
Epoch	2000.0
Galactic Longitude	287.662164
Galactic Latitude	-2.390806
Constellation	Carina
Discovered	2022-04-14 01:04:50
Class	Microlensing Event
Phot.Class	Ulens Candidate 100.0%
Last MJD	60184.56631
Last G Mag	12.7
Target importance (0-10)	9.99
Cadence requested (d)	1.0
Observing priority	330.0
Sun Separation (deg)	62.0

Other names:

GAIA_ALERTS
Gaia22bpl

GAIA_DR3
5254100872645875968

NEOWISE
NEOWISE+J159.67677_-61.2638

CRTS
CRTS+J159.67677_-61.2638

constellation

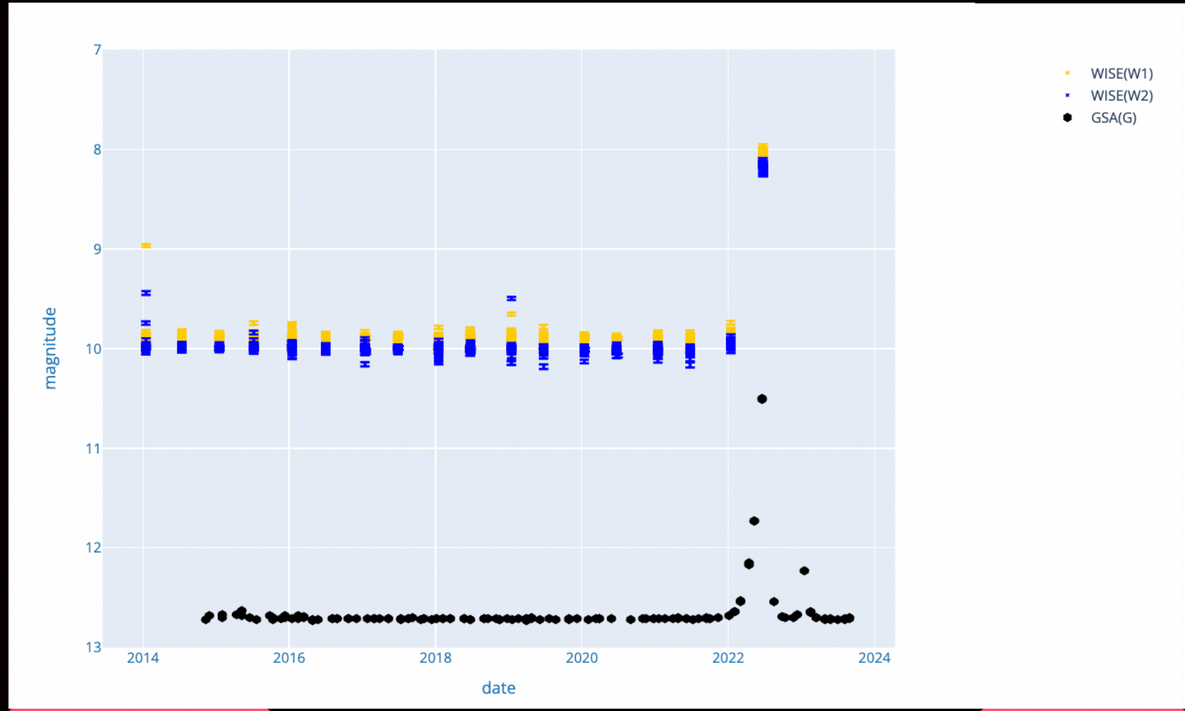
automatic classification

external links

external links

Photometry | Models | Spectroscopy | Observe | Observations | Publication | Manage Data | Manage Groups

Photometry



Download photometry data | Download radio data

Recent Photometry

Timestamp	Magnitude	Filter	Facility
2023-08-28 13:08:29	12.7100	GSA(G)	Gaia Alerts
2023-08-28 11:08:54	12.7000	GSA(G)	Gaia Alerts
2023-08-05 13:08:59	12.7200	GSA(G)	Gaia Alerts
2023-08-05 11:08:24	12.7100	GSA(G)	Gaia Alerts
2023-07-01 00:07:48	12.7200	GSA(G)	Gaia Alerts

BHTOM2

target detail

Gaia22bpl

Update Target | Delete Target

Name	Gaia22bpl
Right Ascension	159.67677 10:38:42.425
Declination	-61.2638 -61:15:49.680
Epoch	2000.0
Galactic Longitude	287.662164
Galactic Latitude	-2.390806
Constellation	Carina
Discovered	2022-04-14 01:04:50
Class	Microlensing Event
Phot.Class	Ulens Candidate 100.0%
Last MJD	60184.56631
Last G Mag	12.7
Target importance (0-10)	9.99
Cadence requested	1.0
Sun Separation (deg)	62.0

Other names:

GAIA_ALERTS
Gaia22bpl

GAIA_DR3
5254100872645875968

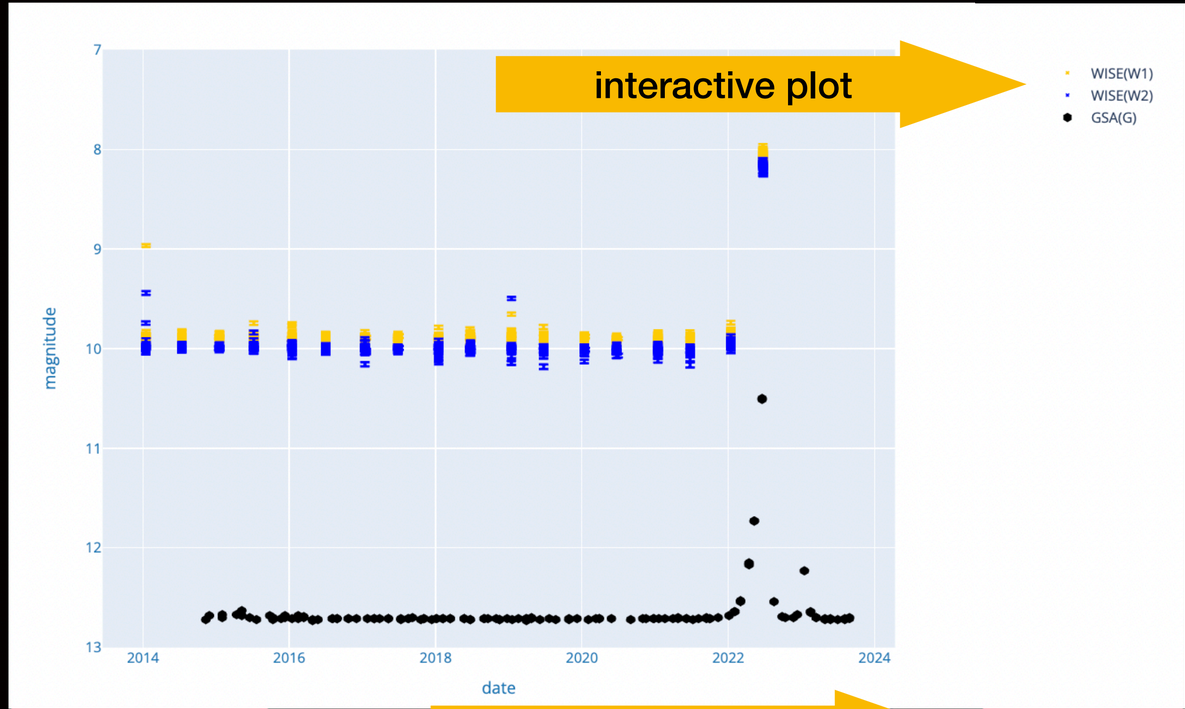
NEOWISE
NEOWISE+J159.67677_-61.2638

CRTS
CRTS+J159.67677_-61.2638

data download

Photometry | Models | Spectroscopy | Observe | Observations | Publication | Manage Data | Manage Groups

Photometry



Download photometry data

radio data download(if exists)

Download radio data

Recent Photometry

Timestamp	Magnitude	Filter	Facility
2023-08-28 13:08:29	12.7100	GSA(G)	Gaia Al…
2023-08-28 11:08:54	12.7000	GSA(G)	Gaia Alerts
2023-08-05 13:08:59	12.7200	GSA(G)	Gaia Alerts
2023-08-05 11:08:24	12.7100	GSA(G)	Gaia Alerts
2023-07-01 00:07:48	12.7200	GSA(G)	Gaia Alerts

most recent photometry

BHTOM2

target detail - comments

created automatically

this is the first person to contact for details on the target and how to observe it

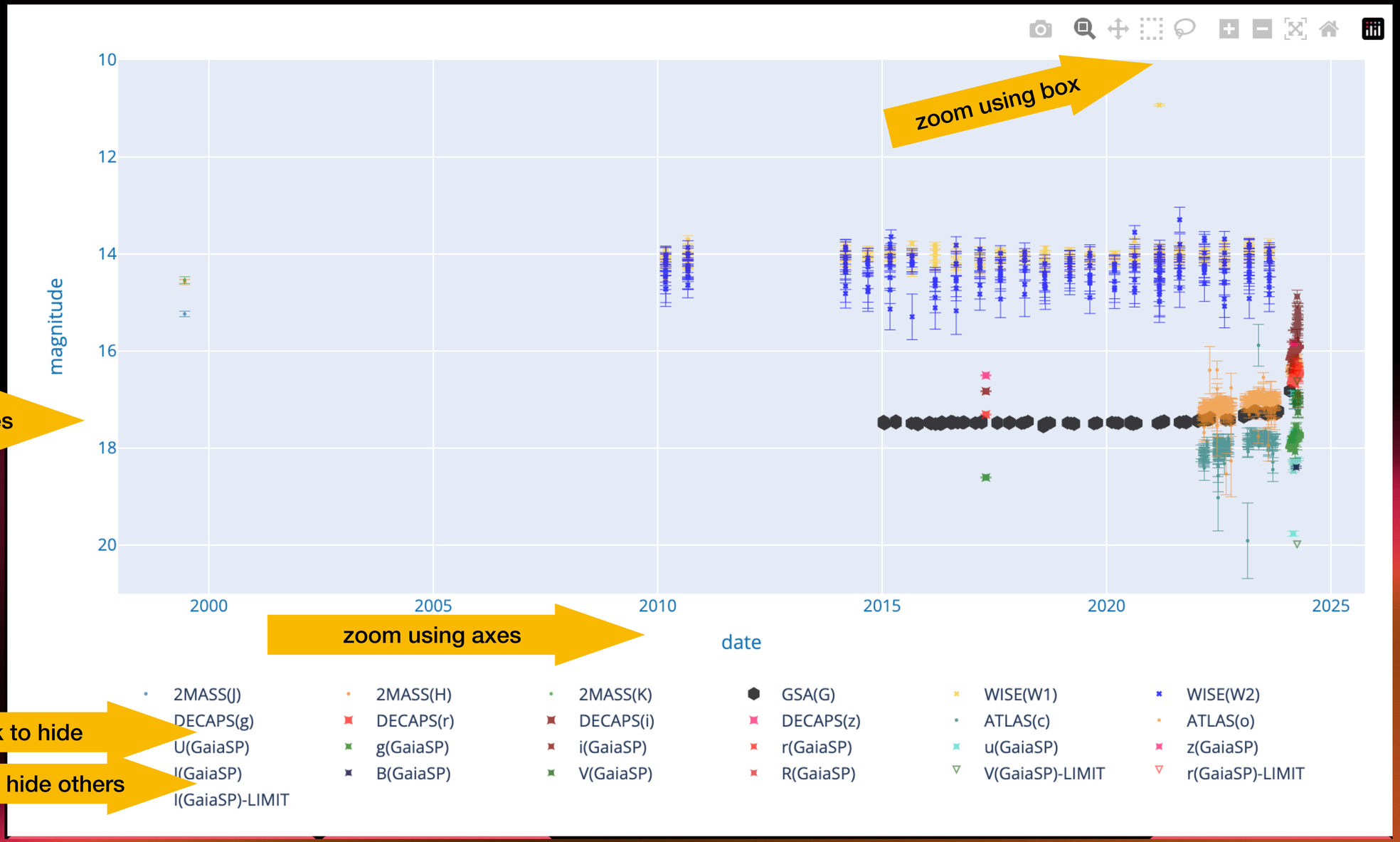
add info how do you want your target to be observed

add any references to existing data or papers

discuss with others, request spectra, etc.

BHTOM2

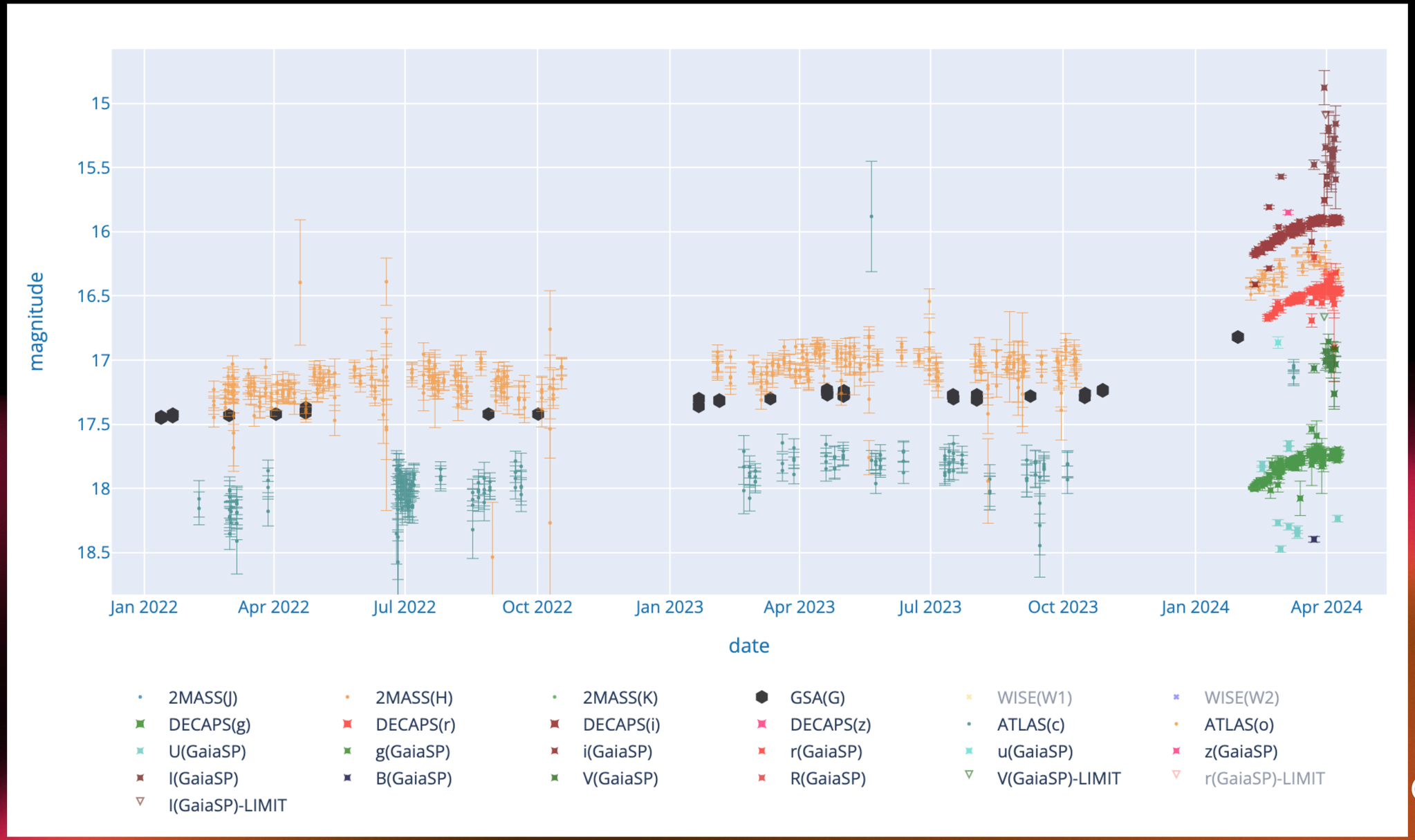
target light curve - per filter



Gaia24amo

BHTOM2

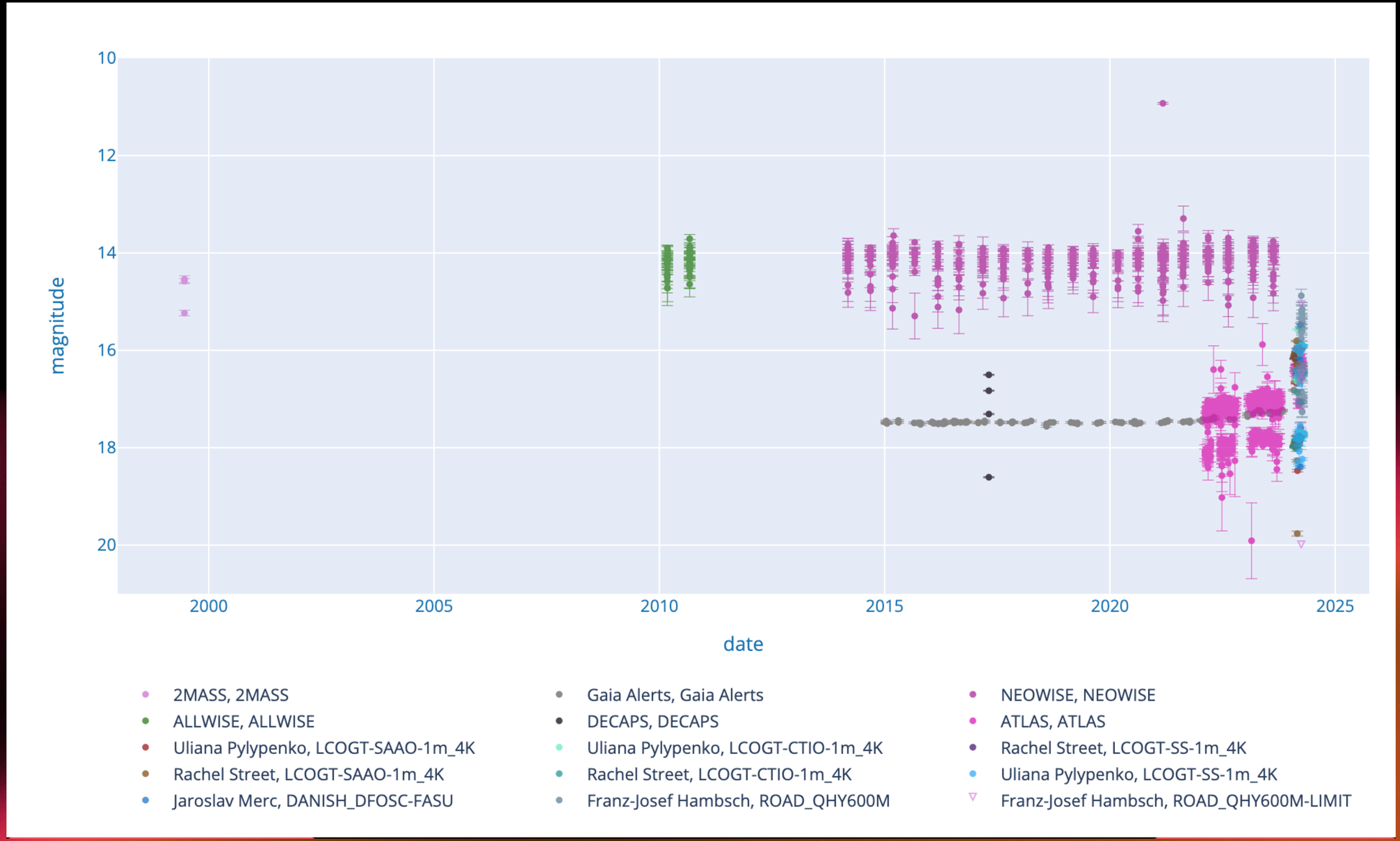
target light curve - per filter



Gaia24amo

BHTOM2

target light curve - per facility

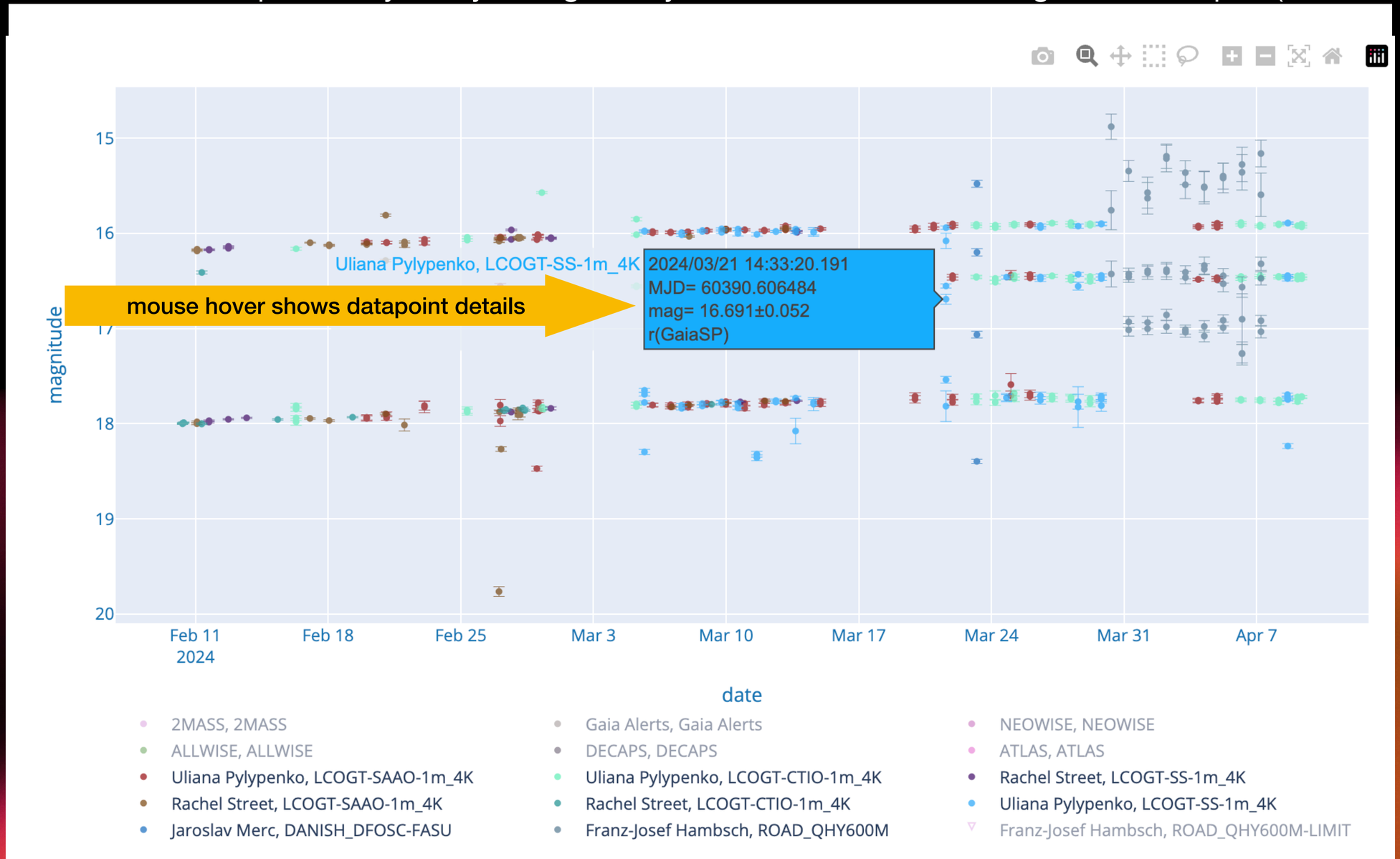


Gaia24amo

BHTOM2

target light curve - per facility

random colours per facility - they change everytime there is a need to re-generate the plot (new data)



Gaia24amo

BHTOM2

data product (DP) page

Calibration tab

photometry file (in Extractor format)

All observers attached to this DP

time when the photometry was completed

Modified Julian Date of the observation

Best filter matched

Zero Point for the best filter

Astrometric scatter (auto)

Calibration | CCDPhot

Target: Gaia22bpl

Photometry	627703.dat
Owner	Lukasz Wyrzykowski
Observers	Lukasz Wyrzykowski
Observatory prefix	UZPW50_Chile_QHY268PRO
Time Uploaded	2025-09-25 14:06:35
Time Photometry	2025-09-26 12:31:24
Status	Calibration successful
MJD	60609.052846366074
Calib Survey/Filter	GaiaSP/any
Standardised to	GaiaSP/g
Magnitude	11.210 +/- 0.002 mag
ZP	-1.973 mag
Scatter	0.033 mag
Number of datapoints used for calibration	121
Outlier fraction	0.0
Matching radius[arcsec]	0.5091168824543144
Dry Run (no data will be stored in the database)	False
Comment	
Calibration log	627703.log

owner (uploader)

observatory ONAME

status: IN PROGRESS, etc.

Filter requested

Mag in the best filter

ZP scatter

Calibration log

BHTOM2

data product (DP) page

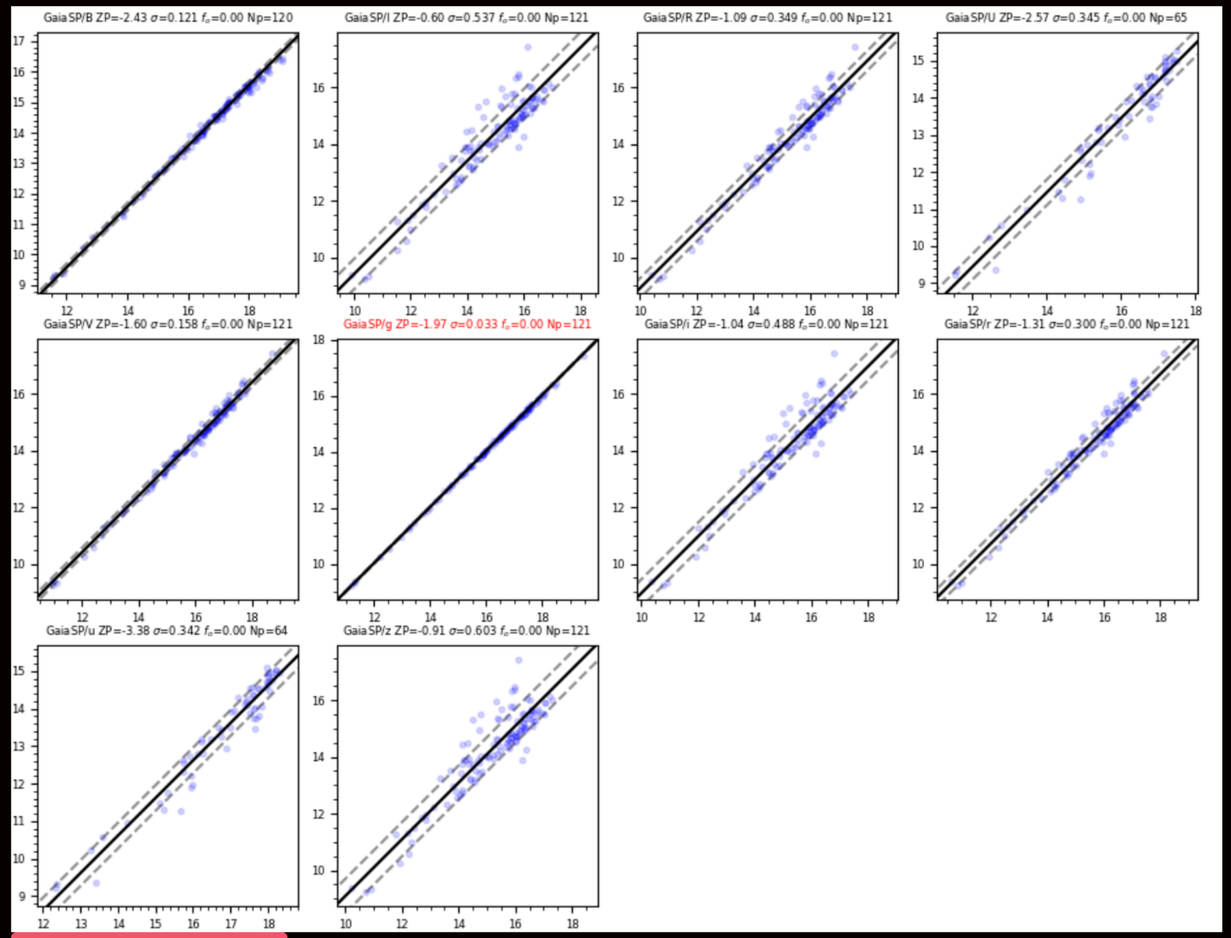
Calibration | CCDPhot

Target: Gaia22bpl

Photometry	
Owner	
Observers	
Observatory prefix	UZPW50_Chile_QHY268PRO
Time Uploaded	2025-09-25 14:06:35
Time Photometry	2025-09-26 12:31:24
Status	
MJD	
Calib Survey/Filter	
Standardised to	
Magnitude	11.210 +/- 0.002 mag
ZP	-1.973 mag
Scatter	0.033 mag
Number of datapoints used for calibration	121
Outlier fraction	0.0
Matching radius[arcsec]	0.5091168824543144
Dry Run (no data will be stored in the database)	False
Comment	
Calibration log	627703.log

For GaiaSP/any, we match your data to Gaia Synthetic Photometry in Johnson-Cousins (UBVRI) and Sloan (ugriz) filters.

Each plot shows the ZP search for each filter. The best one is marked with red. Lowest scatter is selected.



Download Calibration Plot

BHTOM2

data product (DP) page - for FITS

CCDPhot tab

Calibration | CCDPhot

Target: Gaia22bpl

thumbnail image

ONAME

internal priority

Fits	2_2024_10_26_04_23_16_411_Xanthe_R_180_00s_1x1_0_...
Instrument	QHY268PRO
Instrument Prefix	UZPW50_Chile_QHY268PRO
Target RA	323.16291666666666
Target DEC	-29.395138888888887
Dry Run	False
Priority	4
Start Time	2025-09-26 19:47:29
Status Time	2025-09-26 19:52:29
Status Message	Photometry result
Progress	N/A
Original filename	N/A
Object name	411/Xanthe
Origin of the data	UZPW
Name of the observatory site	UZO 50-cm Telescope
Telescope name or type	CDK_50cm
Fits Instrument	QHY268PRO

BHTOM2

data product (DP) page - for FITS

many useful parameters!

Right Ascension of the center of FoV [deg]	323.183542832791
Declination of the center of FoV [deg]	-29.4045584303659
Is Target-Of-Interest present in the frame?	N/A
Binning	2
Pixel scale [arcsec/px]	0.22
Filter in the header	R
Date & Time of observation (at start)	2024-10-26T04:23:16.297
Exposure time [s]	180.0
Modified Julian Date	60609.1828275118
Heliocentric Julian Date	2460609.684094598
Barycentric Julian Date	2460609.684888091
Object elevation above horizon [deg]	N/A
Object azimuth [deg]	N/A
Airmass	1.84759212677573
Moon elevation above horizon [deg]	N/A
Moon azimuth [deg]	N/A
Moon angular distance [deg]	N/A
Moon fractional phase	N/A
Sun elevation above horizon [deg]	N/A
Sun azimuth [deg]	N/A
Sun angular distance [deg]	N/A

Full-Width-at-Half-Maximum along X axis (median) [px]	N/A
Full-Width-at-Half-Maximum along Y axis (median) [px]	N/A
Average Full-Width-at-Half-Maximum [px]	N/A
Average calculated seeing [arcsec]	N/A
Number of stars detected in the image	N/A
Calculated limiting magnitude in the frame in Gaia G [mag]	N/A
Photometric flag	N/A
Processing Node ID	N/A
Pipeline Version	N/A

BHTOM2

models

Gaia22bpl

Update Target | Delete Target

Name	Gaia22bpl
Right Ascension	159.67677
	10:38:42.425
Declination	-61.2638
	-61:15:49.680
Epoch	2000.0
Galactic Longitude	287.662164
Galactic Latitude	-2.390806
Constellation	Carina
Discovered	2022-04-14 01:04:50
Class	Microlensing Event
Phot.Class	Ulens Candidate 100.0%
Last MJD	60184.56631
Last G Mag	12.7
Target importance (0-10)	9.99
Cadence requested (d)	1.0
Observing priority	336.7
Sun Separation (deg)	62.0

Other names:

Photometry | Models | Sp... | ...ication | Manage Data | Manage Groups

models

Microlensing model standard — The simplest microlensing model, single lens, single source, no parallax

Microlensing model parallax — Microlensing model, single lens, single source, with parallax

your model can be added here!

Comments

No comments yet.

Comment

Comment

Post

BHTOM2

models — separate interactive window

Microlensing model for Gaia22bpl

Gravitational microlensing model using MulensModel (Poleski&Yee 2018)

Fit initial values:

t0: 2459749.048410 u0: 0.129032 tE: 50.00000 logu0: fixblending: auto_init:

parameter init

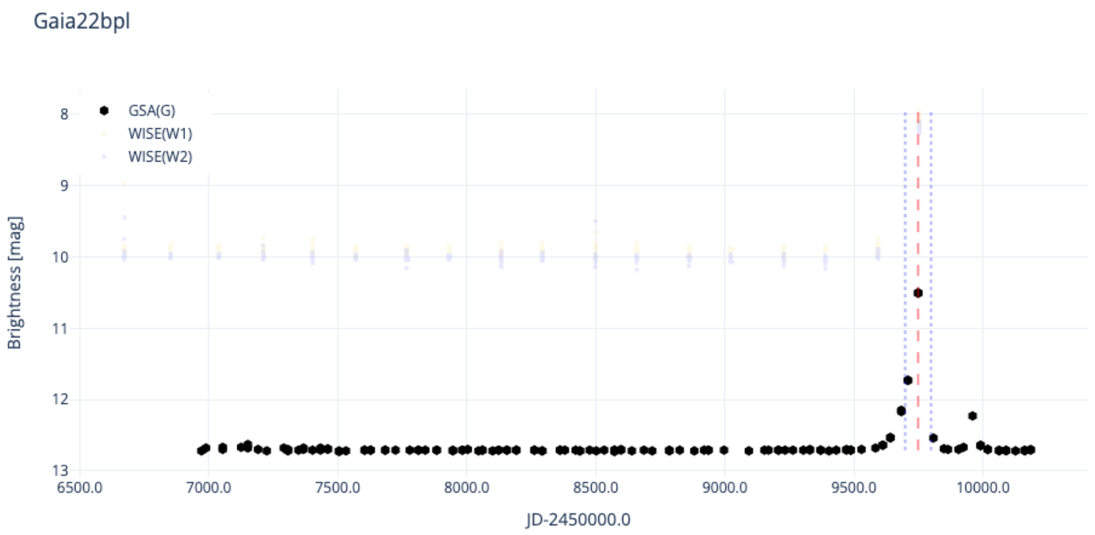
Available filters and number of datapoints:

Select All | Deselect All

- GSA(G) 129
- WISE(W1) 387
- WISE(W2) 387

interactive data selection

MODEL



models

ication Manage Data Manage Groups

microlensing model, single lens, single source, no parallax

Fitted parameters

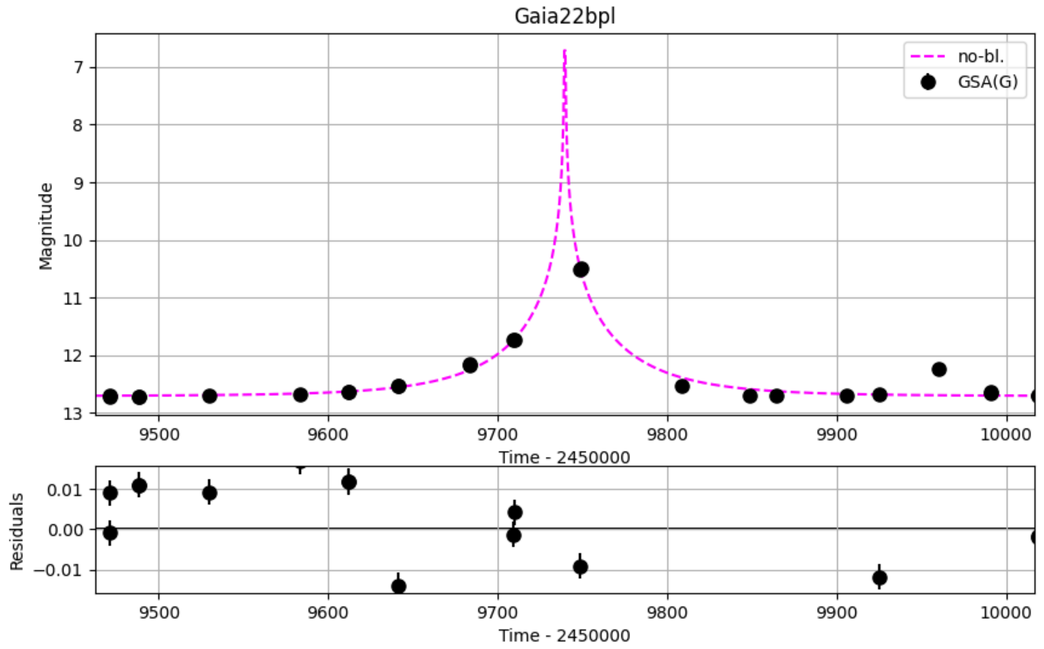
Best Fit: t_0 = 2459739.69022, u_0 = 0.00000, t_E = 69.268

Chi2 = 23120.64 Chi2/ndof = 183.50

model results

Filter	Mag0	FS
GSA(G)	12.708	1.0

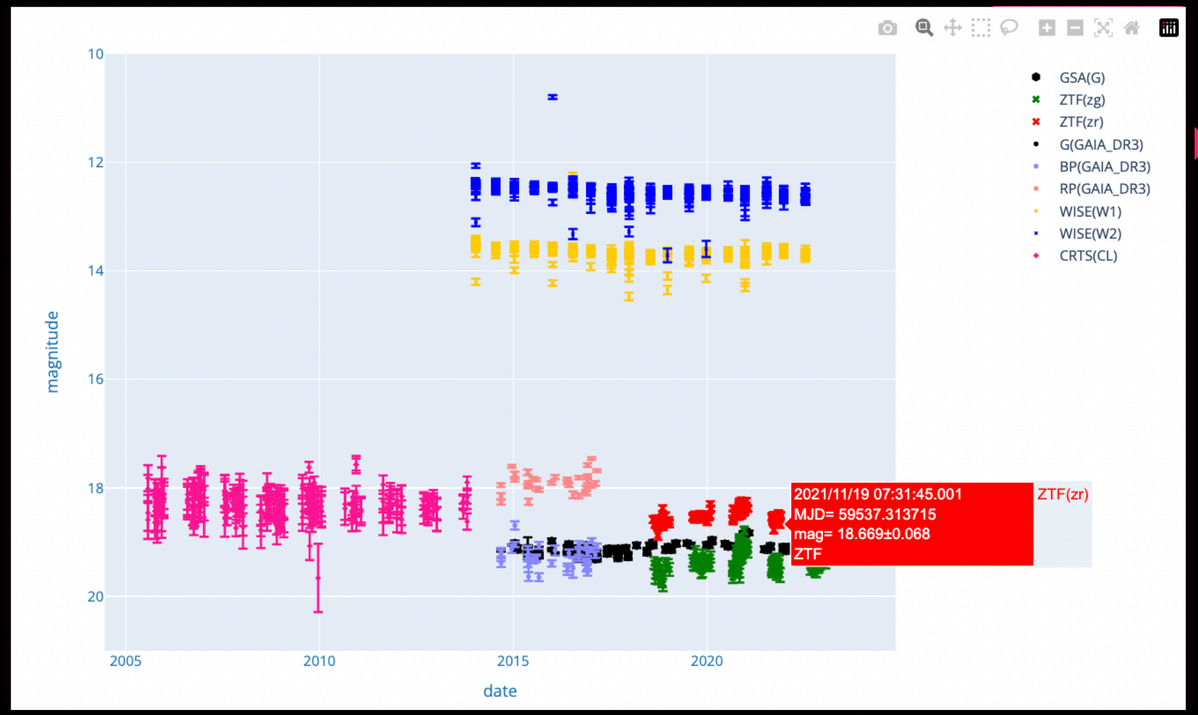
Fitted light curve



Time of fitting execution: 0.112 seconds

archives (via brokers)

- Gaia Science Alerts (2014-2025)
- Gaia DR3 variables (2014-2017)
- ZTF Data Release and alerts (2018+) through ANTARES and Alerce
- Catalina Real-Time Survey, CRTS (2005-2014)
- LINEAR (2003-2008)
- SDSS + Stripe82
- PS1, DECAPS (single epochs)
- IR: 2MASS, ALLWISE + NEOWISE (2010-2024)
- FIRST and LOFAR (radio)
- ATLAS (South+North)
- OGLE EWS (microlensing events)
- OGLE OCVS (variable stars)
- ASAS-SN
- will be added:
  - + DASH Harvard photographic plates (<1900)



publication

BHTOM2

Gaia19axp

Update Target | Delete Target

Name	Gaia19axp
Right Ascension	216.94333 14:27:46.399
Declination	29.51063 +29:30:38.268
Epoch	2000.0
Galactic Longitude	45.028655
Galactic Latitude	68.703383
Constellation	Boötes
Discovered	2019-03-10 14:03:41
Class	Quasar(QSO)
Phot.Class	Not Ulens 78.0%
Last MJD	-10000.0
Last G Mag	100.0

Photometry | Models | Spectroscopy | Observe | Observations | Publication | Manage Data | Manage Groups

Generate LaTeX target description

Photometry Stats

Facility	Filters	Number	Min MJD	Max MJD
ALLWISE	WISE(W1), WISE(W2)	177	55210.69	55574.43
CRTS	CRTS(CL)	235	53470.35	56464.28
Gaia Alerts	GSA(G)	139	57037.46	60202.07
NEOWISE	WISE(W1), WISE(W2)	591	56670.95	59752.75
SDSS	SDSS(u), SDSS(g), SDSS(r), SDSS(i), SDSS(z)	37	52821.22	53117.36
ZTF	ZTF(zg), ZTF(zr), ZTF(zi)	1134	58202.38	60124.24

Download photometry stats as LaTeX table

BHTOM2

upload

Photometry | Models | Spectroscopy | Observe | Observations | Publication | Manage Data | Manage Groups

Upload a data product

Here you can upload your photometric and spectroscopic observations for this target. Please refer to the BHTOM manual for details.
Example CSV formats for photometry and spectroscopy. Note, we require MJD (Modified Julian Date = JD-240000.5) in the photometry file!
SExtractor format is required for instrumental photometry. FITS is not supported for spectra yet.
Non-detections are marked with error >= 99.0 (e.g. 99.0, 99.9 etc.)
For photometric FITS processing choose the observatory from the list. You can add a new observatory here.
You can upload up to 5 files at once.

You can also use a python script for external fits upload, see the BHTOM's API documentation

Choose a Files

Choose files No file chosen

Data product type

- (•) Photometry - SExtractor format
- ( ) Photometry - CSV
- ( ) FITS File
- ( ) Spectroscopy

[ ] Dry Run (no data will be stored in the database)

MJD OBS *

MJD OBS *

[ ] Dry Run (no data will be stored in the database)

Observer's Name *

Lukasz Wyrzykowski

Observatory

Force filter

GaiaSP/any

Comment

Comment

Upload

BHTOM2

observatory — adding existing observatory to your list

List of observatories

List of your registered observatories/instruments you can use for uploading the data for processing. You should register an observatory in your account if you want a datapoint to be l
Here you can add a new observatory to your list if you are planning to upload images or instrumental photometry for it. You can choose one from the list of already registered observa
one. Note that different instrument (e.g. CCD) on the same telescope counts as a different observatory.

Favorite Observatories | Observatories

Add new observatory

click to add to your list

Observatory Name	Lon	Lat	Prefix	Comment	Only Instrumental photometry file	Details
Adiyaman 60 / Andor iKon-M 934	321.77459	37.751703	Adyu60_Andor-934	PlaneWave 24" CDK on ASA DM16...	False	Details
Adonis observatory / Moravian G2 1600 camera	357.074618	50.91524	Adonis_G2-1600	Sky-watcher quattro F4 250 mm...	False	Details
Aristarchos telscope / TEK2K camera	337.803889	37.984444	ARISTARCHOS_TEK2K	Aristarchos 2.3 m telescope, ...	False	Details
Astrolab IRIS Observatory / SBIG camera	357.087333	50.817222	Astrolab-IRIS_SBIG	68-cm NMPT telescope. Public ...	False	Details
ASV 1.4 m Milankovic Telescope / Andor iKon-L CCD camera	338.45	43.15	ASV1.4_Andor	The Astronomical Station Vido...	False	Details
ATA50 with Apogee Alta U230	318.75611111	39.904752	ATA50_AltaU230	51 cm RC telescope on ASA Dir...	False	Details

Add a new Observatory to your list.

Here you can add a new observatory to your list in two ways.
You can choose an observatory from the list of already registered ones.
If your observatory is not yet registered you can create a new entry.

Observatory

Comment

Comment

Add to my list

Create new Observatory

BHTOM2

observatory — creating observation no yet in our db

Create a new Observatory.

Please fill the form below, check BHTOM manual for details. Your entry has to be then activated by the Administrator.

The sample fits file is necessary for new observatories for verification of the automatic photometric processing. Please refer to the BHTOM Manual or get in touch.

Observatory name

Observatory name

Longitude (West is positive) [deg]

Longitude (West is positive) [deg]

Latitude (North is positive) [deg]

Latitude (North is positive) [deg]

☑ Only instrumental photometry file

Create Observatory

only SExtractor instrumental data will be uploaded

longer table if fits will be processed

☐ Only instrumental photometry file

Sample fits*

Choose files No file chosen

Provide one sample fits per filter, clearly labelled.

Gain* [electrons/ADU]

2.0

Readout noise* [electrons]

2

Binning*

1

Saturation level* [ADU]

63000

Pixel scale* [arcsec/pixel]

0.8

Readout speed [ms/pixel] (if not known, pass 9999)*

3

Pixel size [um]

13.5

Approx. limit magnitude in V band* [mag]

18.0

Filters*

V,R,I

Altitude [m]*

0.0

Comments (e.g. hyperlink to the observatory website, camera specifications, telescope info)

Comments (e.g. hyperlink to the observatory website, camera specifications, telescope info)

Create Observatory

this will require human acceptance

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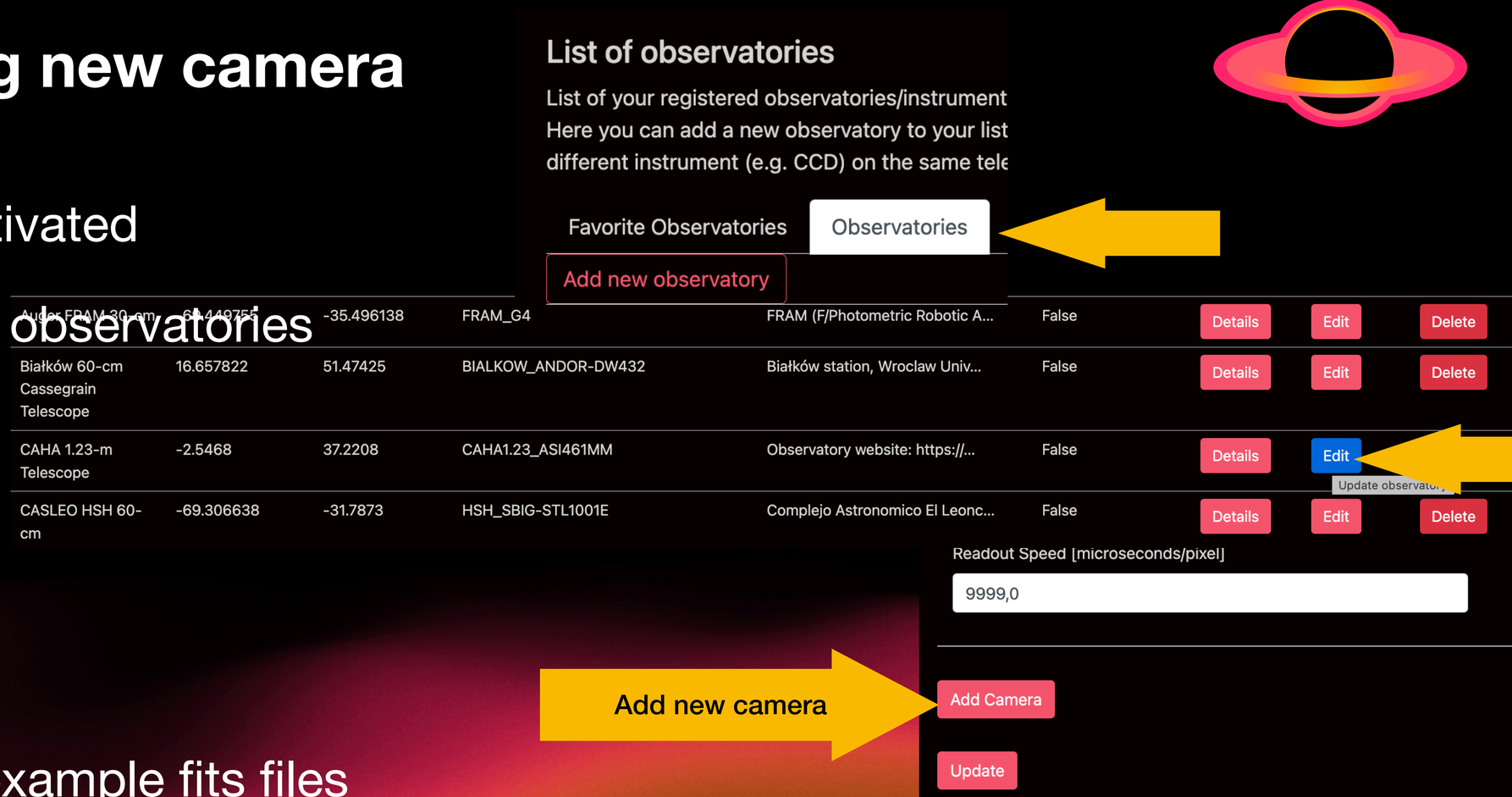
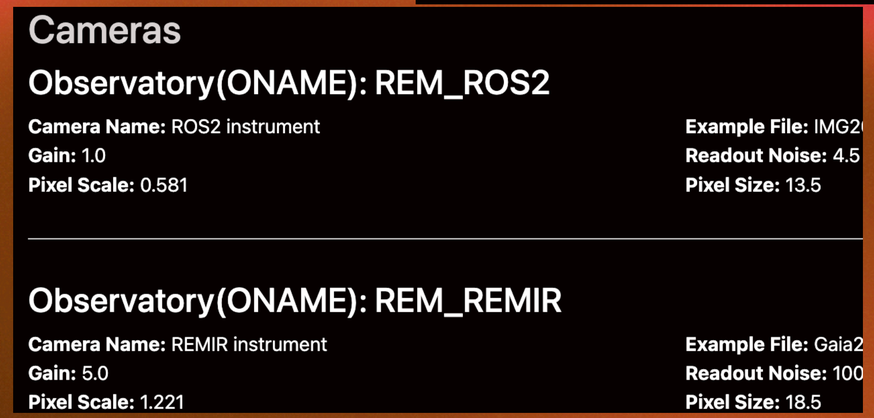
observatory - adding new camera

- Observatory has to be activated
- Go to Observatory/List all observatories
- Find your observatory
- Click Edit
- At the very bottom:
  Click Add New Camera
- Fill all the details, attach example fits files
- Wait for the approval
- Your new camera will have new ONAME
  (for API use)





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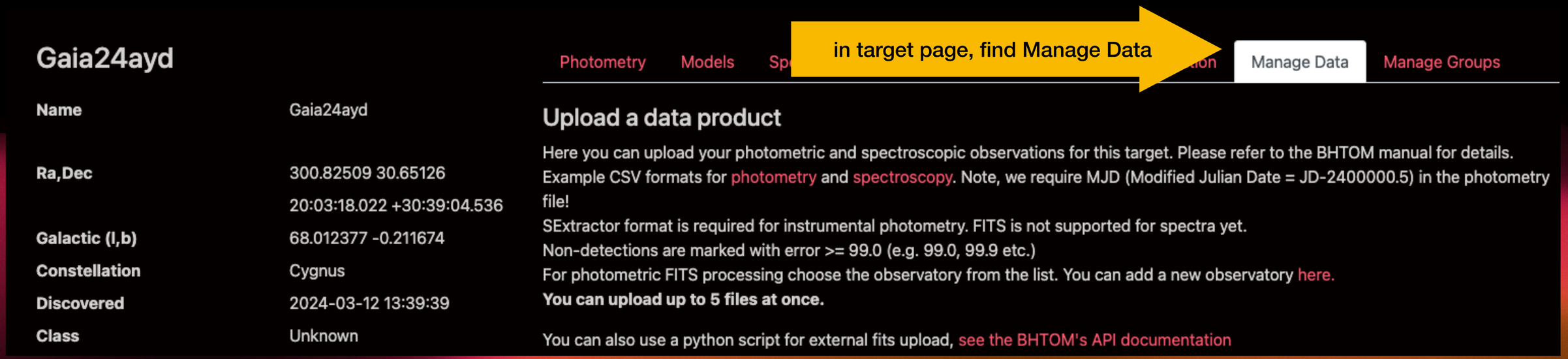
upload — uploading fits images

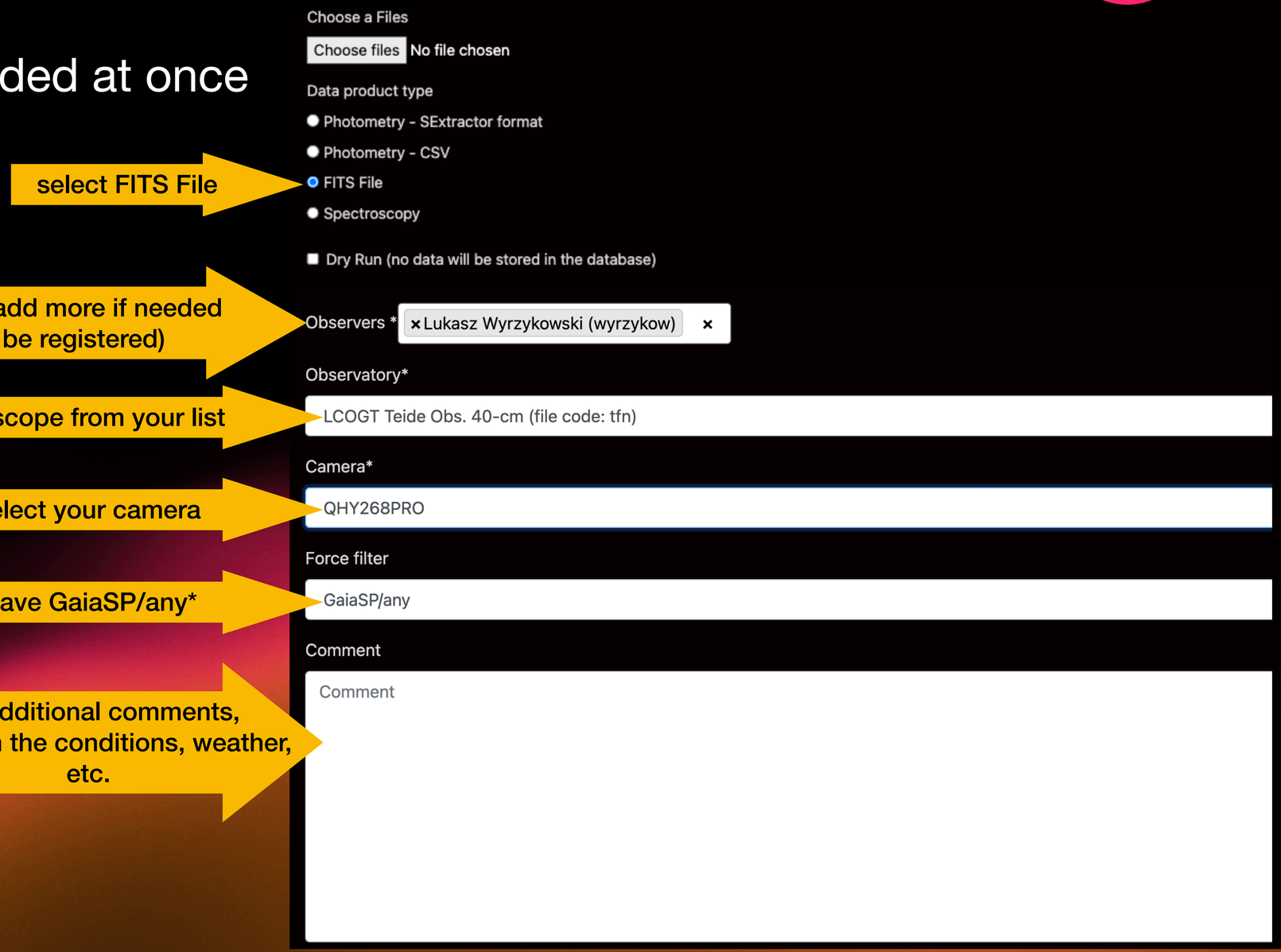
pre-requisites:

- bias/dark/flat corrected fits only
- your observatory registered and activated



upload — uploading fits images

- in GUI only 5 files can be uploaded at once
- use scripts for more files!



Note on filters for standardisation:

* GaiaSP/any is best for most filters, either Johnson-Cousins or Sloan
* if you use only Sloan, select GaiaSP/ugriz
* if you use only J-C, select GaiaSP/UBVRI
* if you use Gaia filters, select GaiaDR3/any
* if you observe in IR, select 2MASS/any
* if you are not sure, select Auto

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upload — uploading SExtractor photometry

- in GUI only 5 files can be uploaded at once
- use scripts for more files!

select SExtractor

MJD=JD-2400000.5

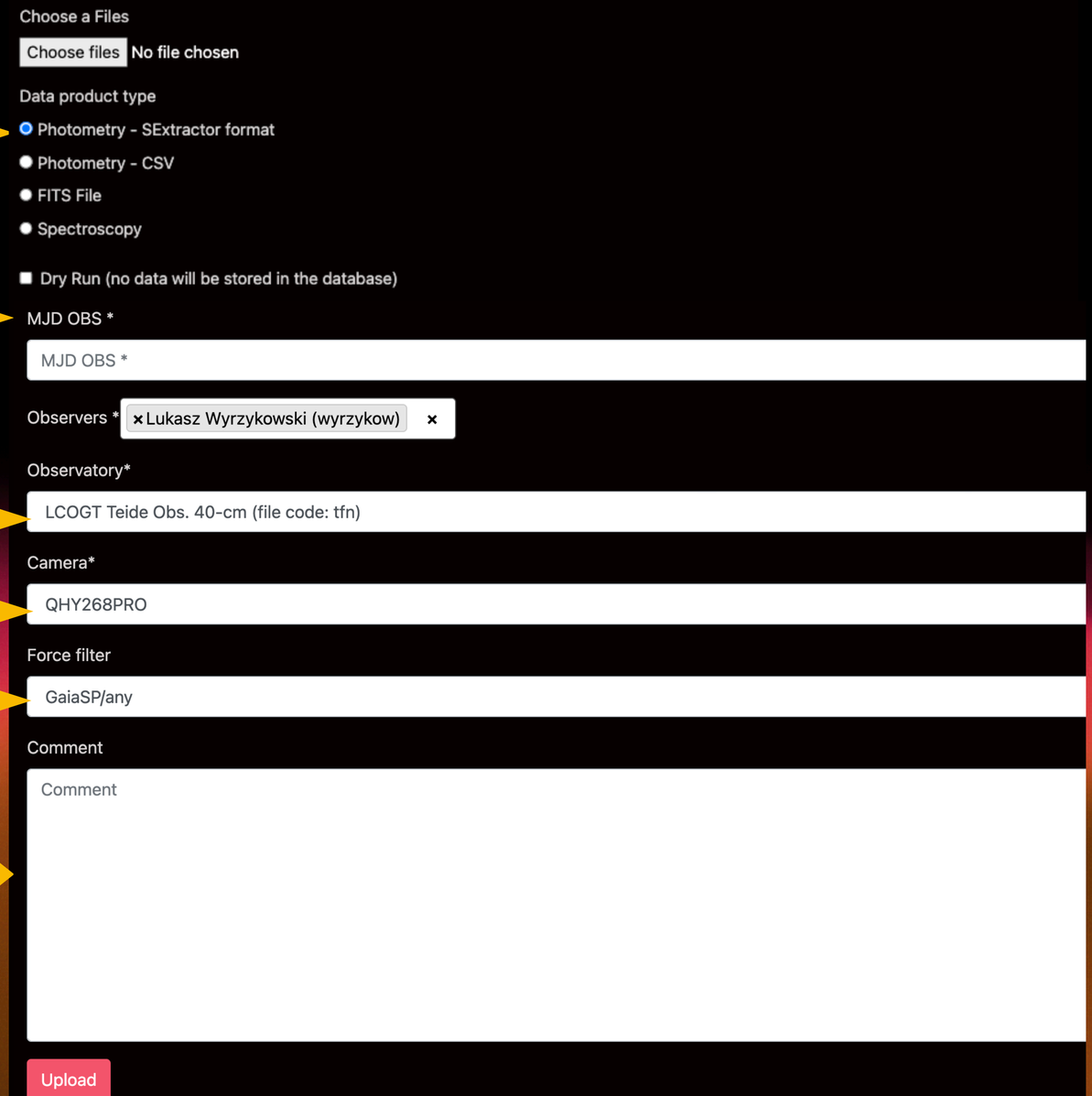
default: you; add more if needed (need to be registered)

select a telescope from your list

select your camera

leave GaiaSP/any*

any additional comments, e.g. on the conditions, weather, etc.



Note on filters for standardisation:

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* if you use only J-C, select GaiaSP/UBVRI
* if you use Gaia filters, select GaiaDR3/any
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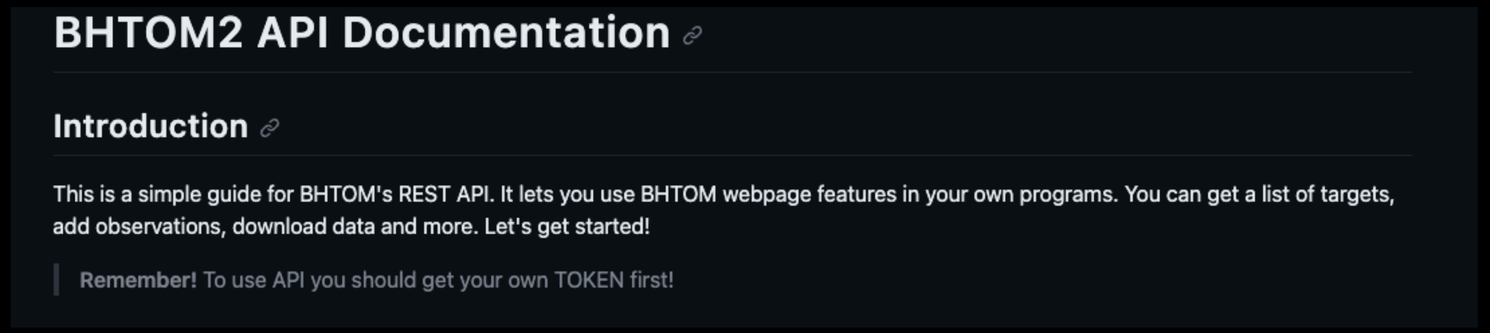
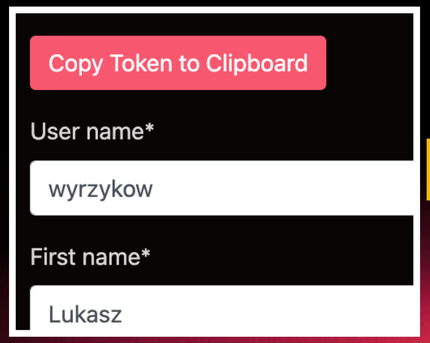
* if you are not sure, select Auto

API

docs.bhtom.space

- all functionalities of BHTOM available programmatically!
- upload (fits, dat, spec)
- target list and filtering
- data download
- standardisation results





Token now can be copied from your profile page

API

docs.bhtom.space

- all functionalities of BHTOM available programmatically!
- upload (fits, dat, spec)
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- data download
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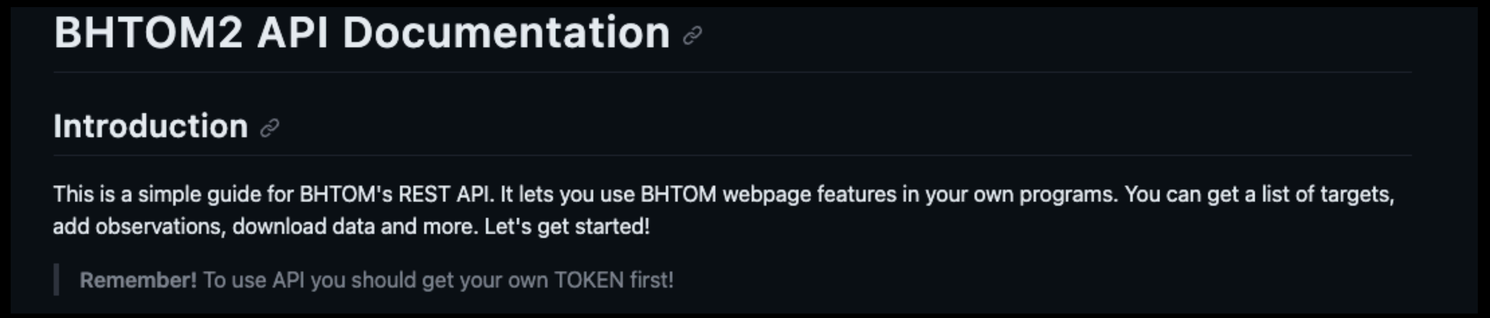

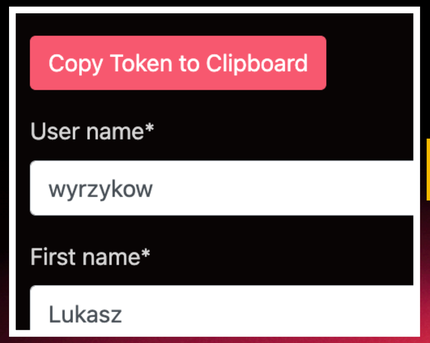

Token now can be copied from your profile page

BHTOM API Example Notebooks:

https://drive.google.com/drive/folders/1A9Oe1rApyI7_orazo_1oUNVqdzhE-w4M?usp=sharing

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https://groups.google.com/g/bhtomtargets

BHTOM Targets for 08 April, 2024

0 views

Lukasz Wyrzykowski <wyrzykow@gmail.com>

8 Apr 2024, 16:12:21 (5 days ago)

to bhtomtargets@googlegroups.com

Hello,

Greetings from the BHTOM Automated Newsletter!

As of 2024-04-08 14:09:01.478552+00:00, these are the new targets added in the last week with importance greater than 1, sorted by magnitude:

name	ra	dec	mag_last	sun_separation	classification	description
Gaia24bbw	81.371630	39.506760	14.2	65.0	Unknown	candidate microlensing event
Gaia24bbs	270.968180	-28.183980	16.2	108.0	Unknown	bulge candidate microlensing event
Gaia24bau	266.011980	-25.859980	16.7	112.0	Unknown	candidate microlensing event
Gaia24bay	262.530760	-27.944750	17.0	115.0	Unknown	candidate microlensing event
Gaia24adu	205.400100	43.413980	17.3	129.0	Unknown	~1 mag rise in Gaia source coincident with galaxy
Gaia24bbt	264.611000	-33.329870	17.5	113.0	Unknown	bulge candidate microlensing event
Gaia23dkq	183.716870	-19.030480	17.8	162.0	Unknown	Brightening in Gaia source coincident with galaxy 6dFGS gJ121452.1-190150
Gaia23dgk	228.359390	27.081950	18.1	134.0	Unknown	Brightening in Gaia source coincident with galaxy
Gaia23bat	242.658540	-35.559640	18.2	130.0	Unknown	candidate microlensing event
Gaia24bcm	253.619790	-50.373170	18.9	NaN	Unknown	candidate microlensing event
AT 2024fkm	208.285587	35.720493	20.2	136.0	Unknown	Astro-COLIBRI target

In addition, here are some older targets that are currently visible and requested for observations. These targets have an importance greater than 4, a sun separation greater than 70, and a magnitude less than 18. They are also sorted by magnitude.

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In addition, here are some older targets that are currently visible and requested for observations. These targets have an importance greater than 4, a sun separation greater than 70, and a magnitude less than 18. They are also sorted by magnitude.

North (dec>0):

name	ra	dec	mag_last	sun_separation	classification	description
TCrB	239.875676	25.920170	12.3	127.0	Nova	recurent nova predicted to explode 2024/2025
8C0716_714	110.472701	71.343434	14.0	84.0	QSO	high cadence variability suspected
Gaia24ayd	300.825090	30.651260	14.7	74.0	Unknown	bright candidate for microlensing event
Gaia18bwz	174.611270	3.368310	15.3	155.0	CV	Known dwarf nova QZ Vir in outburst
Gaia24azc	296.202220	23.630800	15.4	79.0	Unknown	bright gal.plane source candidate microlensing event or Be-type outburst
NGC5683-Seyfert	218.718578	48.661870	15.5	121.0	AGN	active nucleus of a nearby galaxy for frequent monitoring
SN2024gy	183.963708	13.115589	15.7	156.0	SN	classified SN Ia at 5Mpc
ZTF18aarippg	217.566838	23.062372	16.1	144.0	QSO	Tick-Tok possibly merging Super Massive Black Hole binary
SN2023ixf	210.910654	54.311674	16.8	117.0	SN	Bright supernova in M101
Gaia23dfy	281.922640	9.043970	16.8	94.0	Unknown	red gal.plane source candidate microlensing event rises by 0.7 mag
SN 2024elf	264.113343	39.965370	16.8	102.0	SN	Astro-COLIBRI target
SN 2024eib	200.350801	23.861445	17.0	149.0	SN	Astro-COLIBRI target
Gaia23dgt	204.096070	25.538710	17.1	147.0	QSO	Brightening in Gaia source coincident with Seyfert I galaxy
Gaia24acn	298.644780	30.361130	17.2	76.0	Unknown	Candidate microlensing event
SDSSJ094533.99+100950.1	146.391622	10.163917	17.8	127.0	QSO	Long term variable quasar for monitoring

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South (dec<0):

name	ra	dec	mag_last	sun_separation	classification	description
Gaia23ckh	266.770410	-35.991370	13.0	111.0	Symbiotic star	Mira brightens by 0.8 mag, previous event seen
Gaia23cpd	287.536760	-4.720760	13.8	90.0	Microlensing Event	potential long and bright microlensing event
Gaia19dbf	178.699417	-64.491850	14.2	121.0	Unknown	Possibly a YSO
Gaia23dpn	220.154710	-57.762400	14.4	126.0	Microlensing Event	bright red gal.plane source candidate microlensing event rises by 0.8 mag
V4370 Oph	264.987833	-26.461647	15.1	113.0	Nova	Astro-COLIBRI target
Gaia23cyl	266.467690	-42.760060	15.5	110.0	Microlensing Event	microlensing event in the bulge
Gaia23bsf	276.583080	-14.036970	15.8	102.0	Unknown	unknown
AT2024eff	87.924542	-19.218400	16.1	75.0	Unknown	possible nuclear transient, TDE candidate
Gaia23bzg	195.332390	-14.415280	16.3	173.0	QSO	Brightening in known QSO
Gaia24amo	249.148921	-53.749919	16.4	118.0	Unknown	candidate microlensing event, possibly now on the rise
PMNJ0730-6602	112.706495	-66.038578	16.5	99.0	AGN	IAUZ Target
CTS_C30.10	71.833281	-45.627319	16.8	72.0	QSO	Long term variable quasar for monitoring
Gaia23bsd	273.561870	-22.319870	17.0	105.0	Unknown	very slowly rising object, candidate microlensing or Be or YSO
Gaia23cmf	266.551870	-21.014000	17.1	112.0	Microlensing Event	candidate microlensing event
Gaia23cxu	235.890310	-55.429890	17.1	123.0	Microlensing Event	candidate disk microlensing event
AT2024bgz	146.019850	-4.201358	17.1	129.0	TDE	New TDE, now is approaching the LC peak
SN2013bw	161.718208	-1.390811	17.3	144.0	SN	close to SN2024hw
Gaia24ata	188.027640	-48.157800	17.4	138.0	Unknown	candidate long microlensing event far from the Gal Plane
Gaia23dpi	222.600550	-66.066000	17.6	119.0	Microlensing Event	candidate long microlensing event or Be star
Gaia21cbi	122.889030	-80.519340	17.6	100.0	Unknown	~0.5 mag rise in Gaia, WISE and GALEX source
Gaia23cnm	285.322920	-18.717130	17.6	94.0	Unknown	slow and long rise, possible microlensing or YSO
Gaia23dgf	120.642180	-2.372900	17.8	104.0	TDE	~0.3 mag rise in Gaia source

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https://groups.google.com/g/bhtomtargets

Last week's targets observed:

camera	target_names
ASV60_FLI	3C454.3
AsiagoAO-0.67_G4-16000	AT2023zgo, Gaia19bzp
Flarestar-MPC171_G2-1600	Gaia24ayd, TCrB, Gaia23cpd
GeoNAO_SXVR-H36	Gaia23dpn, Gaia23dqt, SN2024gy, Gaia23dau, Gaia24alm
HAO68_G2-1600	Gaia24ayd, SN 2024eib, NGC5683-Seyfert, 8C0716_714, TCrB, Gaia24acn, ZTF18aarippg, Gaia24aup, Gaia23dau, SN2023ixf
Kryoneri-1.2_Andor-Zyla	TCrB, SN2024gy, Gaia18bwz, SN2023ixf
LCOGT-CTIO-1m_4K	Gaia24ata, Gaia24alk, Gaia23cbf, Gaia23cvm, Gaia24ams, Gaia23cvq, Gaia24amf, Gaia23cme, Gaia23cnu, SN2023utm, Gaia23cuq, Gaia23cpd, Gaia18dif, Gaia23dpi, Gaia23cvl, Gaia23dpd, Gaia23dpn, Gaia23cvx, Gaia24aom, Gaia23dta, Gaia23cxu, Gaia24amo, Gaia24asr, Gaia24amk
LCOGT-MCD-1m_4K	Gaia23cua, Gaia23cri, Gaia23dau, Gaia23dgt
LCOGT-MCD-40cm_SBIG6303	SN2024gy
LCOGT-SAAO-1m_4K	Gaia23dpd, Gaia24ata, Gaia23cuq, Gaia23dpn, Gaia23dta, Gaia23cnu, Gaia24amo, Gaia23cbf, Gaia23cxu, Gaia23dfy, Gaia23dpi, Gaia24asr, Gaia24amk
LCOGT-SS-1m_4K	Gaia23cuq, Gaia23dpn, Gaia23cvx, Gaia23dta, Gaia23cvm, Gaia24asr
LCOGT-Teide-1m_4K	Gaia23cvq, Gaia23dgt, Gaia23cnu, Gaia23cua, Gaia23cri, Gaia23dau, Gaia23dfy
LCOGT-Teide-40cm_SBIG6303	SN2024gy
OAUJ-CDK500_U47	TCrB
ROAD_QHY600M	Gaia22bpl, Gaia23dpn, Gaia23dnm, Gaia23cpd, Gaia20fnr, Gaia23dit, Gaia24aeh, Gaia24amo, Gaia21ccu, Gaia24ach
RRRT_SBIG-STX16803	TCrB
ZAO_G2-1600	TCrB, Gaia24ayd, SN2024gy, 8C0716_714

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Last week's fits uploads score (sorted by count)

observatory-user	count
Franz-Josef Hambsch (ROAD_QHY600M)	879
Charles Galdies (ZAO_G2-1600)	168
Uliana Pylypenko (LCOGT-SAAO-1m_4K)	103
Nada Ihanec (LCOGT-CTIO-1m_4K)	89
Uliana Pylypenko (LCOGT-CTIO-1m_4K)	87
Nada Ihanec (LCOGT-SAAO-1m_4K)	58
Staszek Zola (OAUJ-CDK500_U47)	47
Alexios Liakos (Kryoneri-1.2_Andor-Zyla)	40
Jan Kåre Trandem Qvam (HAO68_G2-1600)	37
Nada Ihanec (LCOGT-Teide-1m_4K)	35
Nada Ihanec (LCOGT-SS-1m_4K)	32
Teimuraz Kvernadze (GeoNAO_SXVR-H36)	28
Uliana Pylypenko (LCOGT-Teide-1m_4K)	26
Stephen M. Brincat (Flarestar-MPC171_G2-1600)	22
Staszek Zola (RRRT_SBIG-STX16803)	15
Tom Killestein (LCOGT-Teide-40cm_SBIG6303)	15
Uliana Pylypenko (LCOGT-MCD-1m_4K)	13
Nada Ihanec (LCOGT-MCD-1m_4K)	6
Rachel Street (LCOGT-SAAO-1m_4K)	6
Rachel Street (LCOGT-Teide-1m_4K)	5
Rachel Street (LCOGT-CTIO-1m_4K)	5
Tom Killestein (LCOGT-MCD-40cm_SBIG6303)	3
Andrea Reguitti (AsiagoAO-0.67_G4-16000)	2
Uliana Pylypenko (LCOGT-SS-1m_4K)	2
Rachel Street (LCOGT-MCD-1m_4K)	1
Przemyslaw J. Mikolajczyk (ASV60_FLI)	1

BHTOM2

BHTOM Documentation

https://github.com/BHTOM-Team/bhtom2/blob/bhtom2-dev/Documentation/bhtom-service/README.md

BHTOM2 Documentation

Click here for BHTOM2 API documentation. Click here for BHTOM2 instalation documentation.

We strongly recommend running BHTOM2 using Docker to streamline the setup process and ensure a consistent and simplified experience. Docker eliminates many potential configuration issues, making it easier to get started quickly and focus on using BHTOM2 without worrying about environment-specific dependencies.

The visual manual from December 2024 in form of a pdf is available here

Note: the documentation is still in preparation.

The recordings on talks on BHTOM and related topics from the 15th Gaia Science Alerts workshop in Crete 2024 can be found here

You can also listen to a recording on the BHTOM2 presentation by Lukasz Wyrzykowski from Malta 2023 workshop

Overview

BHTOM (Black Hole Target Observation Manager) is an advanced web-based system designed to manage time-domain observations for a network of telescopes. It facilitates data collection, processing, and analysis of astronomical observations. BHTOM is built on top of a scalable architecture that supports integration with multiple services like CPCS, Upload, and Harvester to provide a comprehensive solution

BHTOM2 API Documentation

Introduction

This is a simple guide for BHTOM's REST API. It lets you use BHTOM
add observations, download data and more. Let's get started!

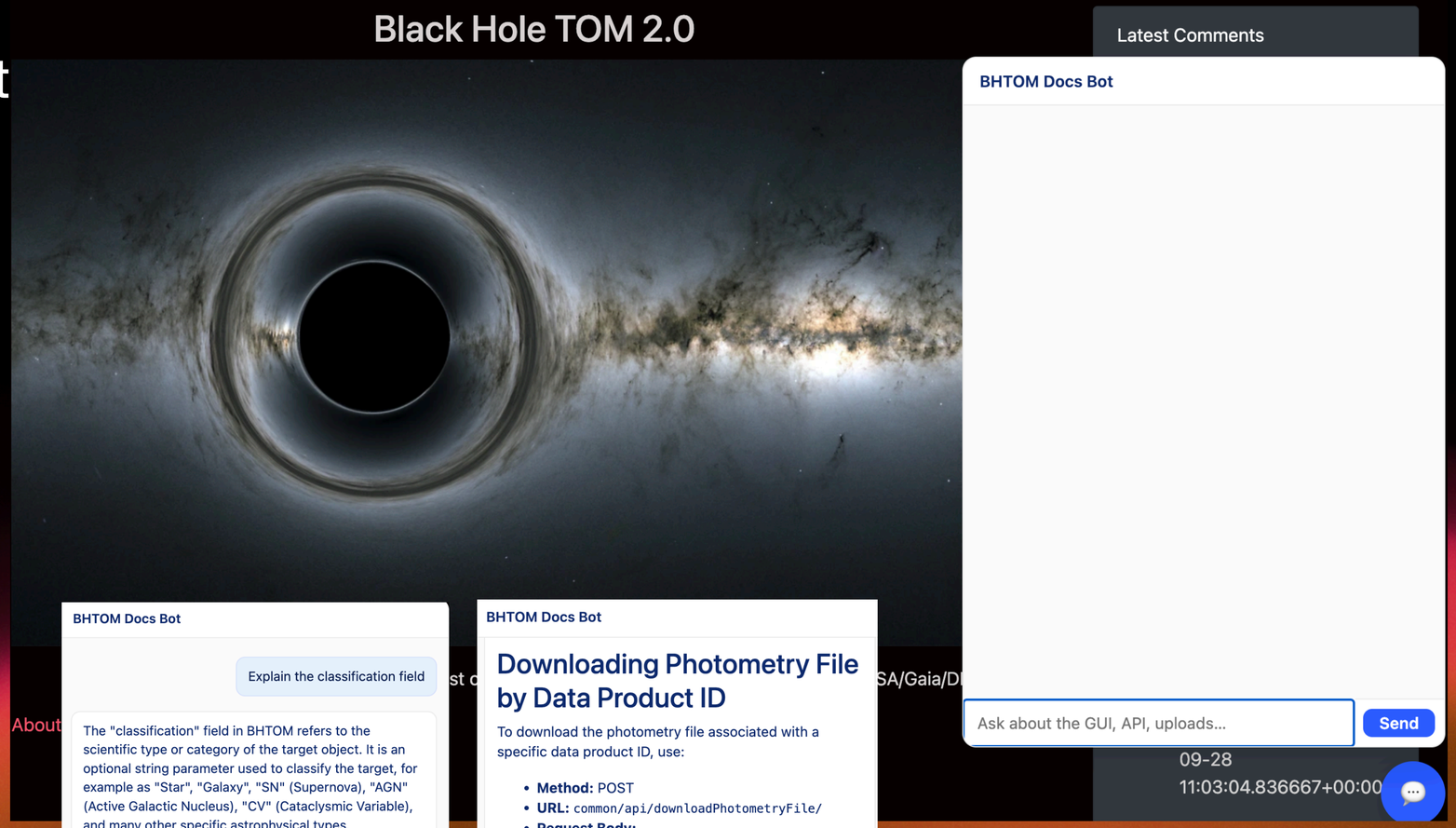
> **Remember!** To use API you should get your own TOKEN first!

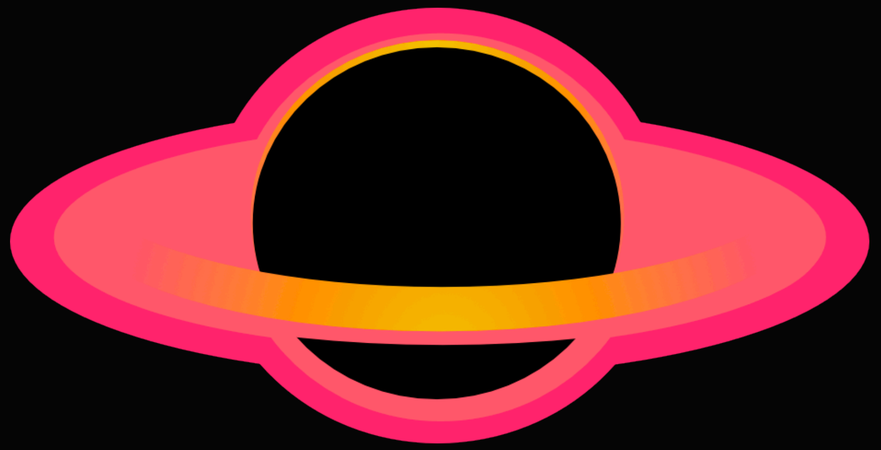
https://github.com/BHTOM-Team/bhtom2/blob/bhtom2-dev/Documentation/DocumentationAPI.md

BHTOM2

BHTOM Documentation - Chat Bot!

- Chat Bot
  - blue circle on the bottom right
- Still being trained
- Exemplary questions:
  - How do I create a target?
  - Is there a way to add many targets at once
  - Explain the fields in the target page
- Try it in your language!!





enjoy bhtom2 !

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