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Łukasz Wyrzykowski
(staff)



Przemek Mikołajczyk
(staff)



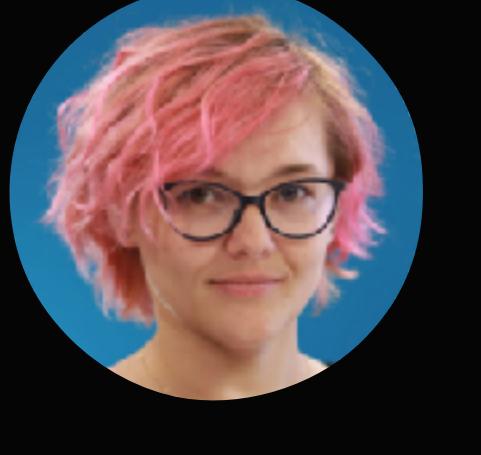
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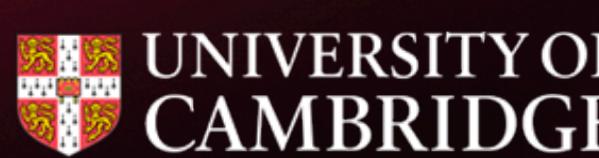


Marius Maskoliūnas
and his group



Andreja Gomboc
and her group

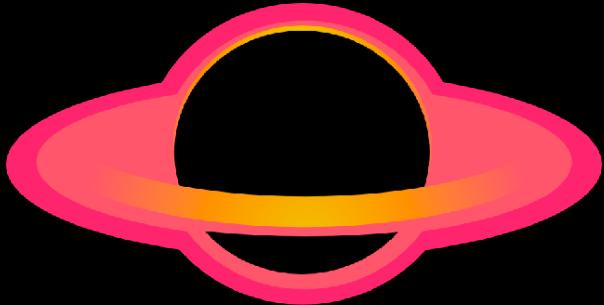
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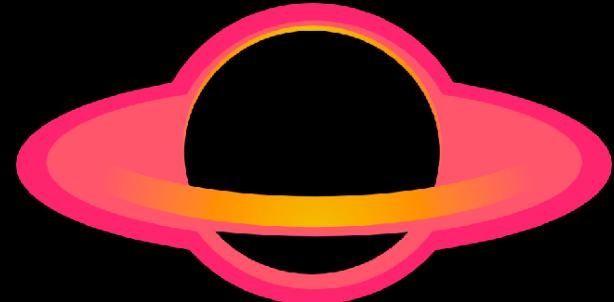
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Astronomy & Astrophysics manuscript no. pap16aye
October 30, 2019

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Full orbital solution for the binary system in the northern Galactic disc microlensing event Gaia16aye*

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(Affiliations can be found after the references)

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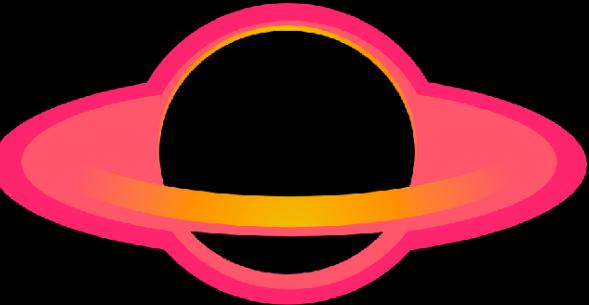
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Astronomy & Astrophysics manuscript no. pap16aye
October 30, 2019

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Full orbital solution for the binary system in the northern Galactic disc microlensing event Gaia16aye*

Łukasz Wyrzykowski^{1,***}, P. Mróz¹, K. A. Rybicki¹, M. Gromadzki¹, Z. Kołaczkowski^{45, 79, ***}, M. Zieliński¹, P. Zieliński¹, N. Britavskiy^{4, 5}, A. Gomboc³⁵, K. Sokolovsky^{19, 3, 66}, S.T. Hodgkin⁶, L. Abe⁸⁹, G.F. Aldi^{20, 80}, A. AlMannaei^{62, 100}, G. Altavilla^{72, 7}, A. Al Qasim^{62, 100}, G.C. Anupama⁸, S. Awipahan⁹, E. Bachelet⁶³, V. Bakış¹⁰, S. Baker¹⁰⁰, S. Bartlett⁵⁰, P. Bendjoya¹¹, K. Benson¹⁰⁰, I.F. Bikmaev^{76, 87}, G. Birenbaum¹², N. Blagorodnova²⁴, S. Blanco-Cuaresma^{15, 74}, S. Boeva¹⁶, A.Z. Bonanos¹⁹, V. Bozza^{20, 80}, D.M. Bramich⁶², I. Bruni²⁵, R.A. Burenin^{84, 85}, U. Burgaz²¹, T. Butterley²², H. E. Caines³⁴, D. B. Caton⁹³, S. Calchi Novati⁸³, J.M. Carrasco²³, A. Cassan²⁹, V. Ćepas⁵⁶, M. Cropper¹⁰⁰, M. Chrušlińska^{1, 24}, G. Clementini²⁵, A. Clerici³⁵, D. Conti⁹¹, M. Conti⁴⁸, S. Cross⁶³, F. Cusano²⁵, G. Damjanovic²⁶, A. Dapergolas¹⁹, G. D'Ago⁸¹, J. H. J. de Bruijne²⁷, M. Dennefeld²⁹, V. S. Dhillon^{30, 4}, M. Dominik³¹, J. Dziedzic¹, O. Erece³², M. V. Eselevich⁸⁶, H. Esenoglu³³, L. Eyer⁷⁴, R. Figuera Jaimes^{31, 53}, S. J. Fossey³⁴, A. I. Galeev^{76, 87}, S. A. Grebenev⁸⁴, A. C. Gupta⁹⁹, A. G. Gutaev⁷⁶, N. Hallakoun¹², A. Hamanowicz^{1, 36}, C. Han², B. Handzlik³⁷, J. B. Haislip⁹⁴, L. Hanlon¹⁰², L. K. Hardy³⁰, D. L. Harrison^{6, 88}, H.J. van Heerden¹⁰³, V. L. Hoette⁹⁵, K. Horne³¹, R. Hudec^{39, 76, 40}, M. Hundertmark⁴¹, N. Ihaneč³⁵, E. N. Irtuganov^{76, 87}, R. Itoh⁴³, P. Iwanek¹, M.D. Jovanovic²⁶, R. Janulis⁵⁶, M. Jelínek³⁹, E. Jensen⁹², Z. Kaczmarek¹, D. Katz¹⁰¹, I.M. Khamitov^{44, 76}, Y. Kilic³², J. Klencki^{1, 24}, U. Kolb⁴⁷, G. Kopacki⁴⁵, V. V. Kouprianov⁹⁴, K. Kruszyńska¹, S. Kurowski³⁷, G. Latev¹⁶, C-H. Lee^{17, 18}, S. Leonini⁴⁸, G. Leto⁴⁹, F. Lewis^{50, 59}, Z. Li⁶³, A. Liakos¹⁹, S. P. Littlefair³⁰, J. Lu⁵¹, C.J. Manser⁵², S. Mao⁵³, D. Maoz¹², A. Martin-Carrillo¹⁰², J. P. Marais¹⁰³, M. Maskoliūnas⁵⁶, J. R. Maund³⁰, P. J. Meintjes¹⁰³, S. S. Melnikov^{76, 87}, K. Meni⁴¹, P. Mikołajczyk⁴⁵, M. Morrell⁴⁷, N. Mowlavi⁷⁴, D. Moždzierski⁴⁵, D. Murphy¹⁰², S. Nazarov⁹⁰, H. Netzel^{1, 79}, R. Nesci⁶⁷, C.-C. Ngeow⁵⁴, A. J. Norton⁴⁷, E. O. Ofek⁵⁵, E. Pakštienė⁵⁶, L. Palaversa^{6, 74}, A. Pandey⁹⁹, E. Paraskeva^{19, 78}, M. Pawlak^{1, 65}, M. T. Penny⁵⁷, B. E. Penprase⁵⁸, A. Piascik⁵⁹, J. L. Prieto^{96, 97}, J. K. T. Qvam⁹⁸, C. Ranc⁷⁰, A. Rebassa-Mansergas^{60, 71}, D. E. Reichart⁹⁴, P. Reig^{61, 75}, L. Rhodes³⁰, J.-P. Rivet⁸⁹, G. Rixon⁶, D. Roberts⁴⁷, P. Rosi⁴⁸, D.M. Russell⁶², R. Zanmar Sanchez⁴⁹, G. Scarpetta^{20, 82}, G. Seabroke¹⁰⁰, B. J. Shappee⁶⁹, R. Schmidt⁴¹, Y. Shvartzvald^{13, 14}, M. Sitek¹, J. Skowron¹, M. Śniegowska^{1, 77, 79}, C. Snodgrass⁴⁶, P. S. Soares³⁴, B. van Soelen¹⁰³, Z. T. Spetsieri^{19, 78}, A. Stankevičiūtė¹, I. A. Steele⁵⁹, R. A. Street⁶³, J. Strobl³⁹, E. Strubble⁹⁵, H. Szegedi¹⁰³, L. M. Tinjaca Ramirez⁴⁸, L. Tomasella⁶⁴, Y. Tsapras⁴¹, D. Vernet¹¹, S. Villanueva Jr.⁵⁷, O. Vince²⁶, J. Wambsganss^{41, 42}, I. P. van der Westhuizen¹⁰³, K. Wiersema^{52, 68}, D. Wium¹⁰³, R. W. Wilson²², A. Yoldas⁶, R. Ya. Zhuchkov^{76, 87}, D. G. Zhukov⁷⁶, J. Zdanavičius⁵⁶, S. Zola^{37, 38}, and A. Zubareva^{73, 3}

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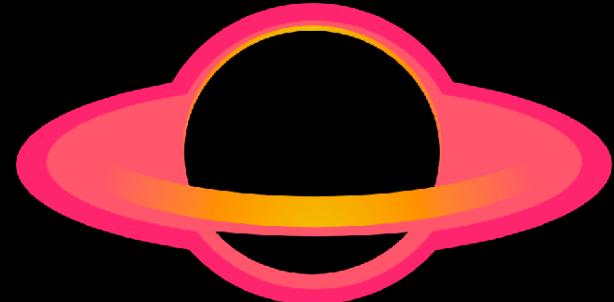
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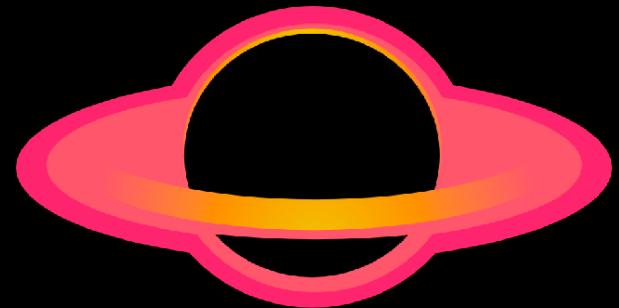
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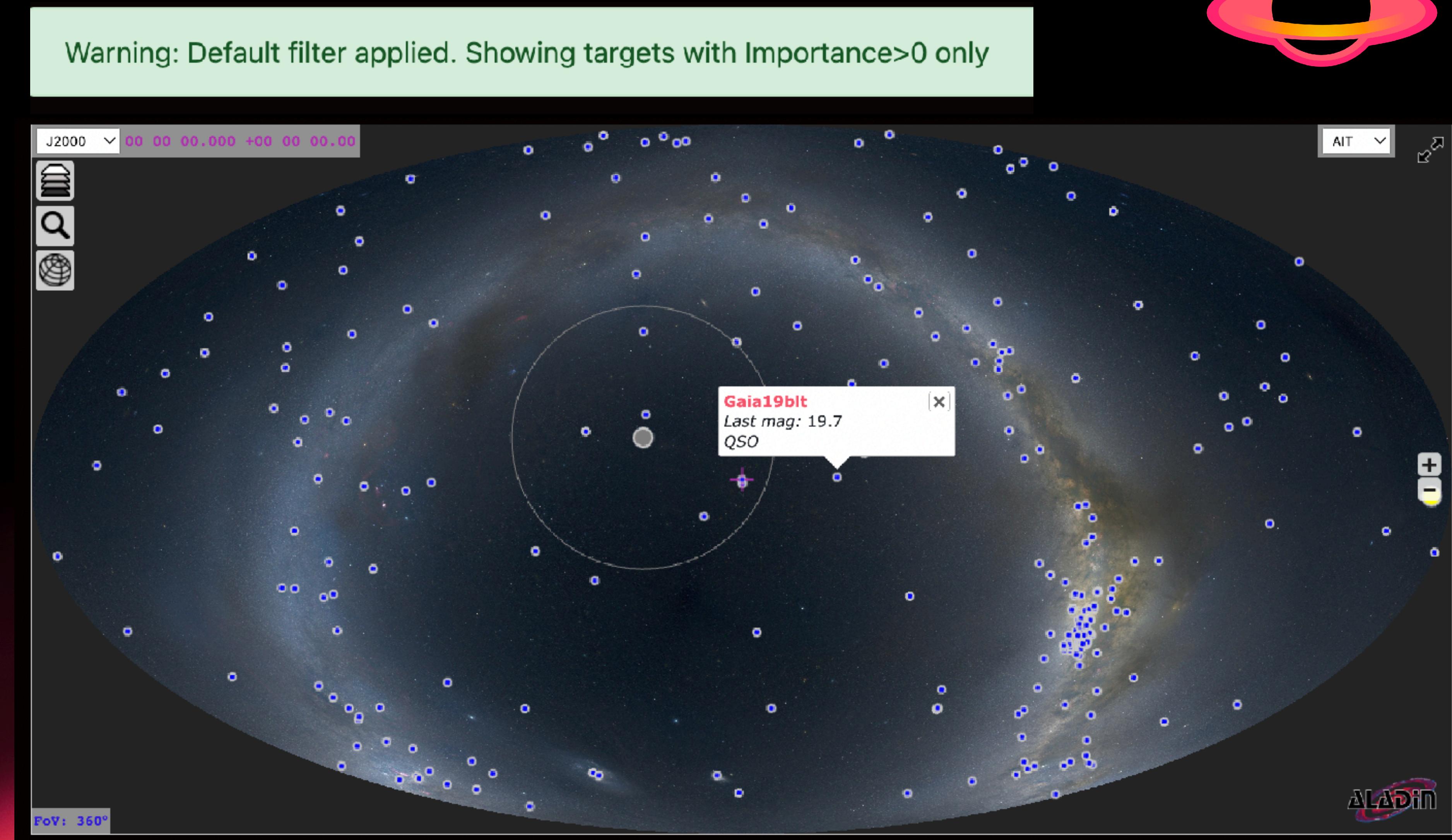
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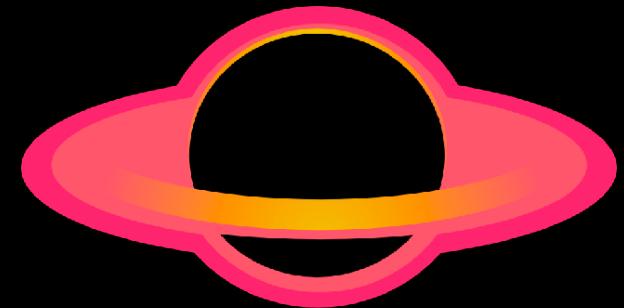
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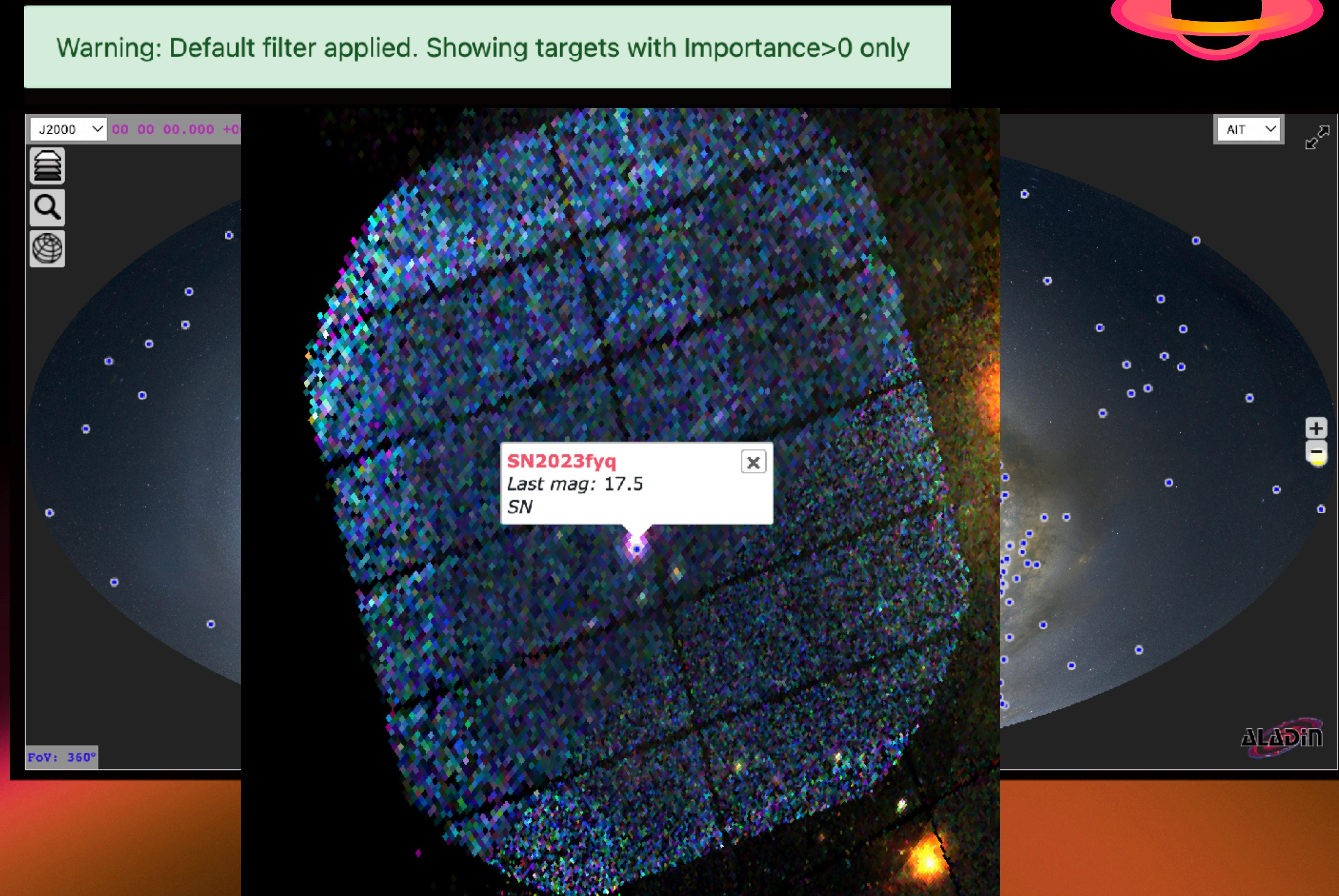
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- equatorial-galactic
- interactive
- Moon
- Sun
- other wavelengths
- grid

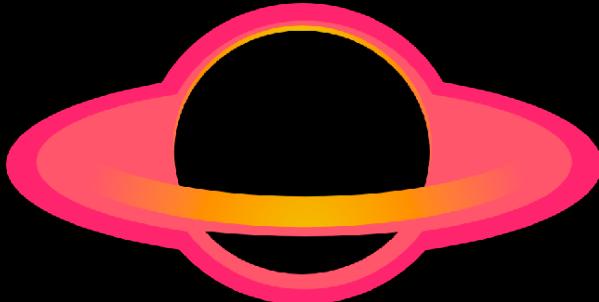




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target lists

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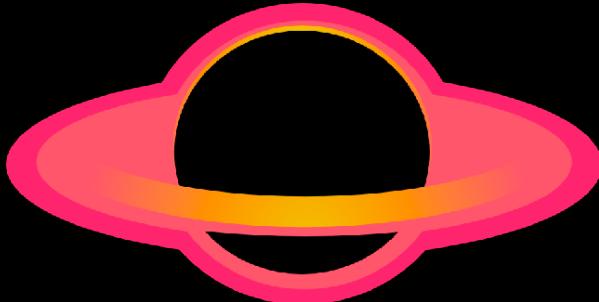
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■	Gaia22bra	19:50:00.876	+26:29:07.908	2150	15.7	Gaia/r	9.99	2023-10-01 17:10:22	23.6	109	Unknown
■	Gaia23cnu	18:56:25.440	-18:04:50.880	1364	15.4	Gaia/r	9.99	2023-10-01 18:10:28	121.6	95	Unknown
■	Gaia21fkl	07:46:28.378	-21:52:32.016	1380	15.8	Gaia/r	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



target lists

target groupings ➡ Add/Remove from grouping ▾ **Add** **Move** **Remove**

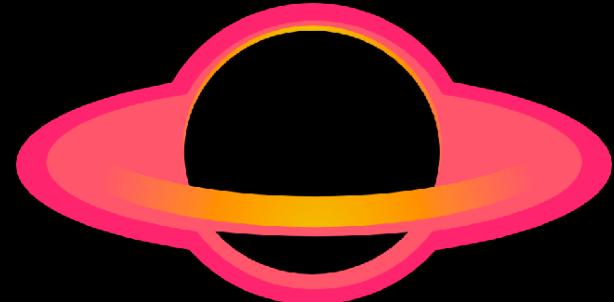
Show **10** entries

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	class as enum ➡	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
■	last magnitude calibrated roughly to Gaia even if no Gaia G available (uses all but WISE bands)			17.7	Gaia/r	9.99	2023-10-01 18:10:28	126.6	89	Unknown	
■	Gaia23cqn	19:08:30.578	+11:08:30.552	1306	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



target lists - filtering example

RA (0,360)

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

Dec (-90,90)

min	0
max	Dec (-90,90)

Importance (0,10)

min	4
max	Importance (0,10)

Sun separation (0,360)

min	60
max	Sun separation (0,360)

Last G magnitude

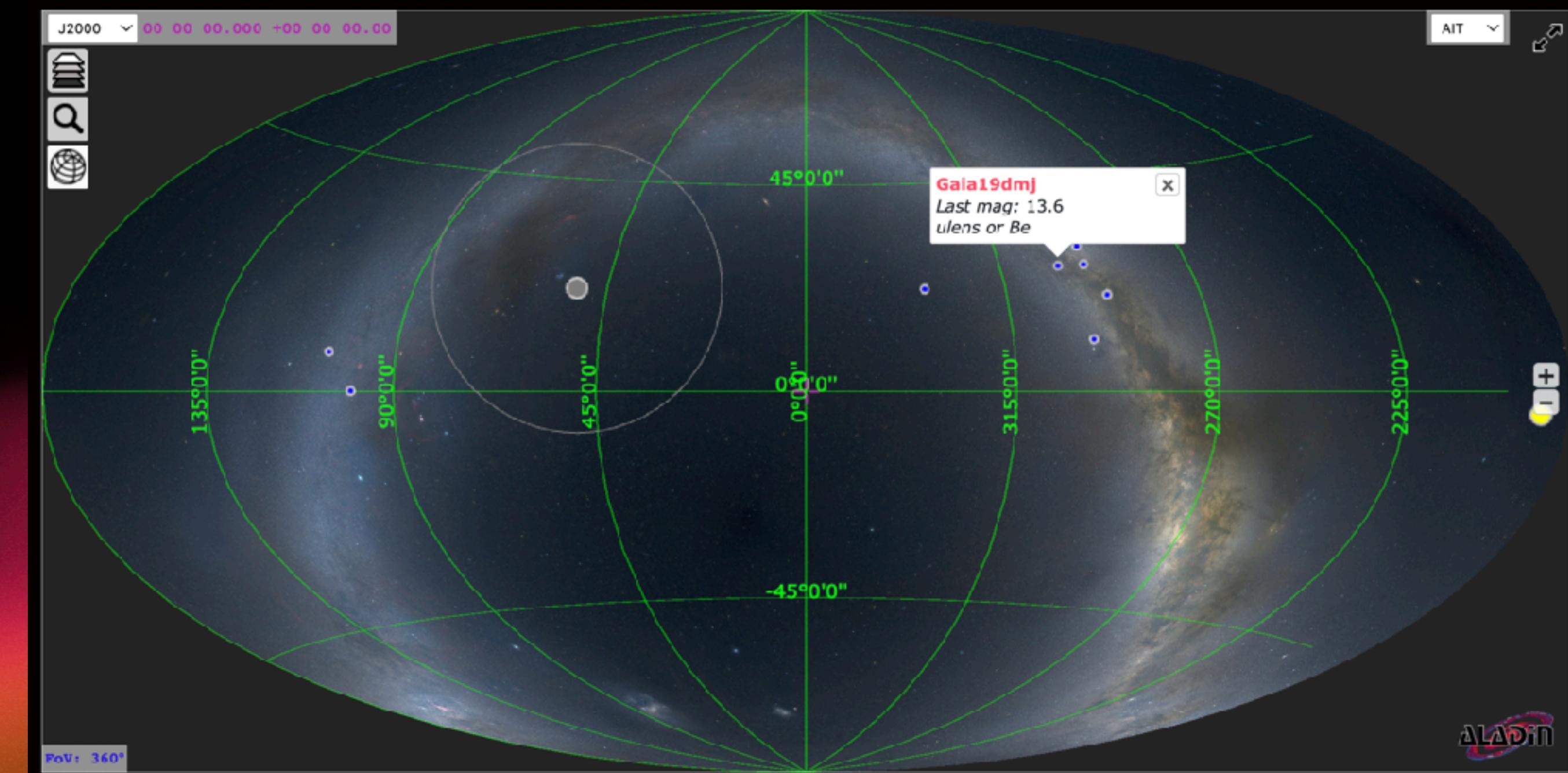
min	Last G magnitude
max	18

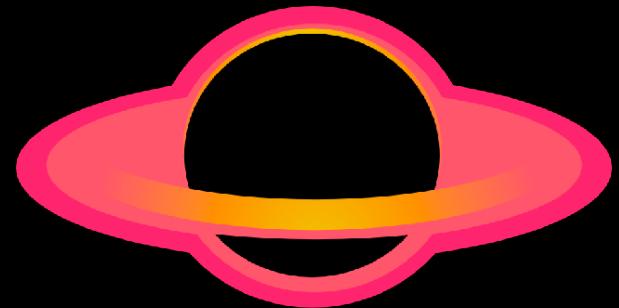
North only

Importance>4

visible now

not fainter than 18 mag

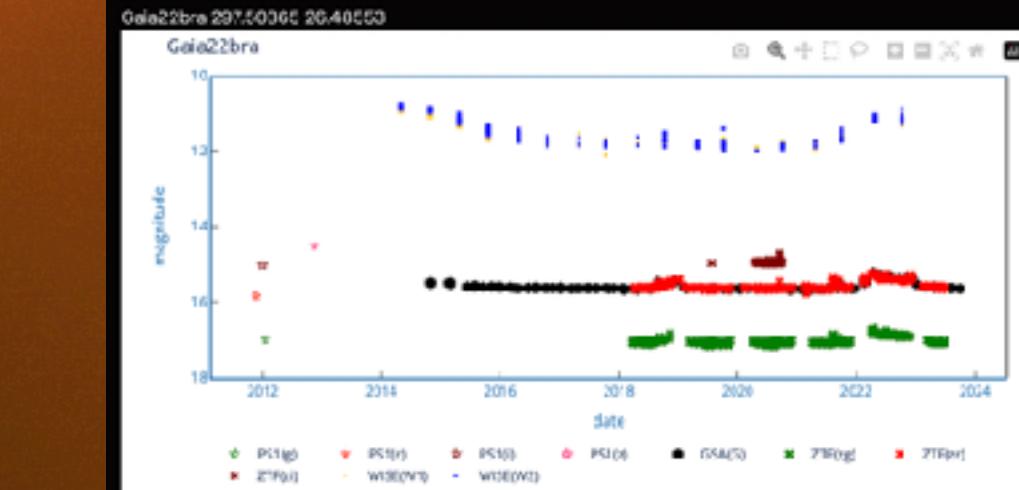
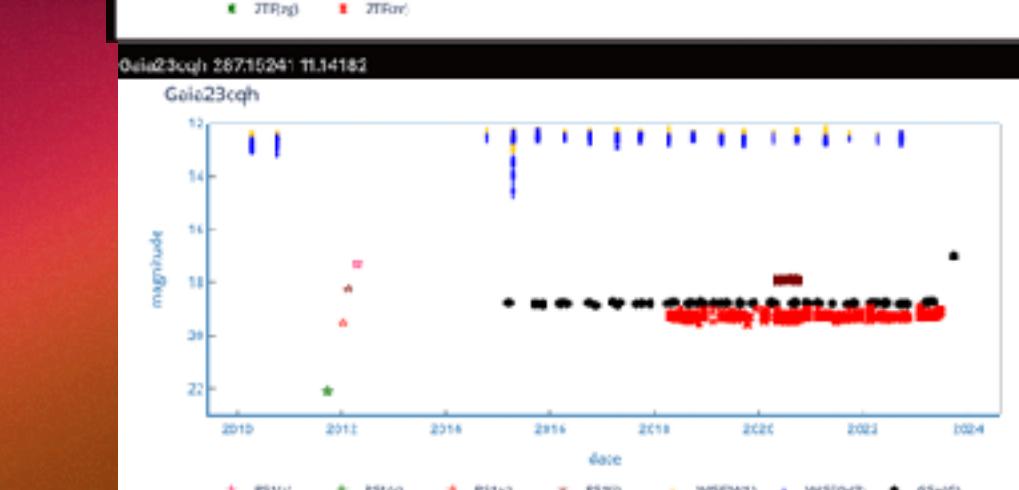
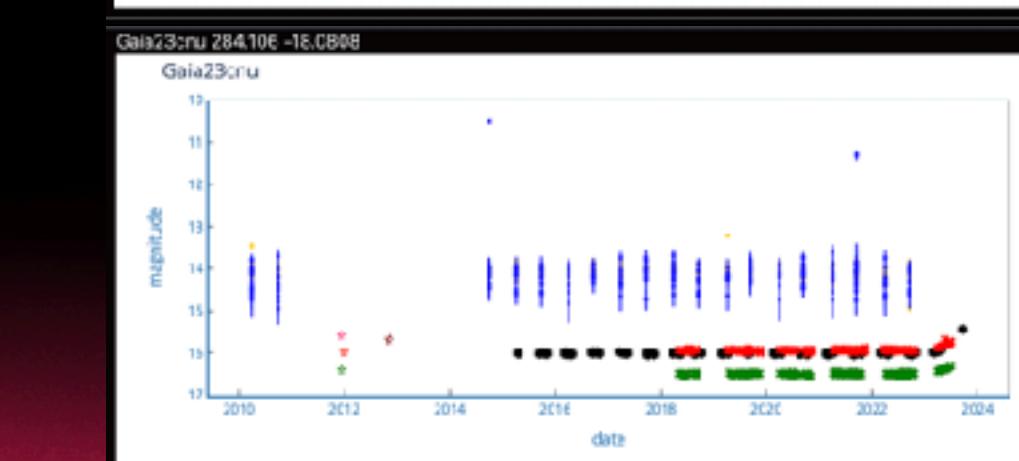
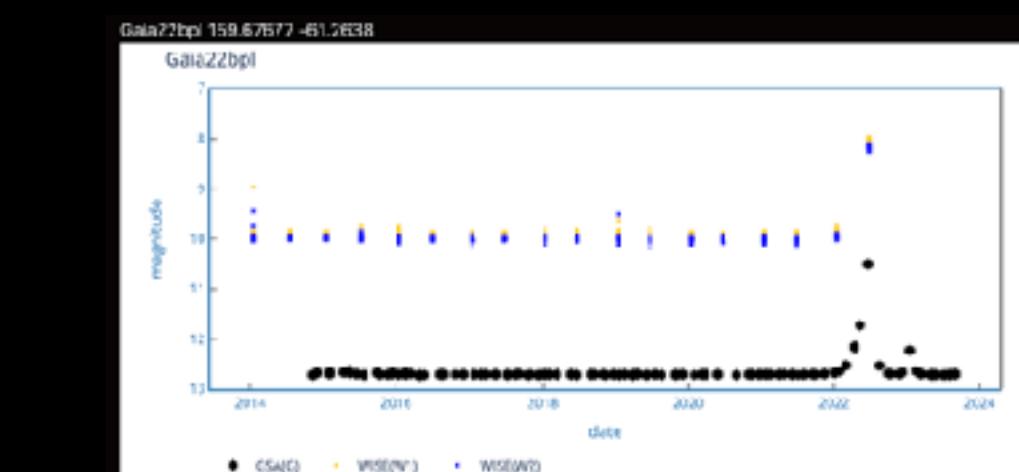




target visual list

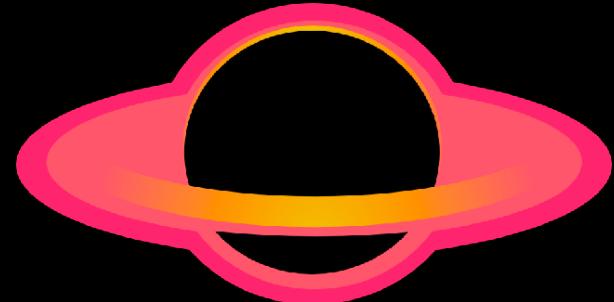
define your filter first

The image shows a mobile application's user interface. At the top, there's a dark grey header bar with a yellow and red circular logo on the left. To the right of the logo, the text "BHTOM" is displayed in white, followed by "About Us", "Targets", and "Target G". Below this header is a main content area with a dark red background. In the upper right corner of the content area, a white dropdown menu is open, containing five items: "List", "Visual list", "Create", "Import", and "Catalog Search". The word "List" is highlighted in blue, indicating it is the selected option.



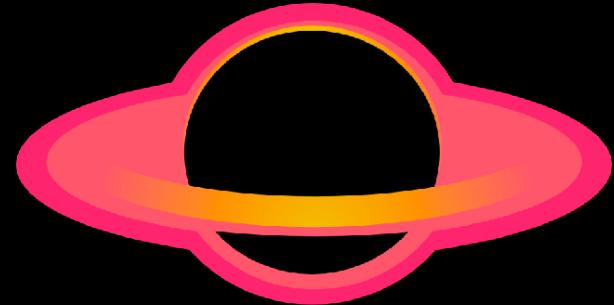
interactive plots

click links to detail



target create

- Create manually
- Import
- Catalog search



target create

- Create manually
- Import
- Catalog search

Create a Target

Sidereal Non-sidereal

Name

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

Right Ascension

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

Declination

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

Epoch

2000,0
Julian Years. Max 2100.

Classification

Unknown

Description

Description

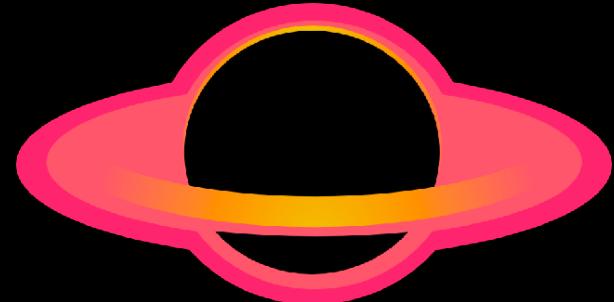
Write human-readable comment what this target is

Lukasz Wyrzykowski (wyrzykow) [Logout](#)

classification types

✓ Unknown

- Be-star outburst
- Active Galactic Nucleus(AGN)
- BL Lac
- Cataclysmic Variable(CV)
- Cepheid Variable(CEPH)
- Eclipsing Binary(EB)
- Galaxy
- Long Period Variable(LPV)
- Luminous Blue Variable(LBV)
- M-dwarf flare
- Microlensing Event
- Nova
- Peculiar Supernova
- Quasar(QSO)
- R CrB Variable
- RR Lyrae Variable
- Solar System Object(SSO)
- Star
- Supernova(SN)
- Supernova imposter
- Symbiotic star
- Tidal Disruption Event(TDE)
- Variable star-other
- X-Ray Binary(XRB)
- Young Stellar Object(YSO)



target create

- Create manually
- Import
- Catalog search

GAIA_ALERTS name

CPCS name

ASASSN name

OGLE_EWS name

ZTF name

ATLAS name

AAVSO name

TNS name

ANTARES name

ZTF_DR8 name

SDSS name

NEOWISE name

ALLWISE name

CRTS name

LINEAR name

FIRST name

PS1 name

DECAPS name

GAIA_DR3 name

GAIA_DR2 name

KMT_NET name

Discovery date

Discovery date

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

Importance

0

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

Cadence

0

Requested cadence (0-100 days)

Groups

Public

Aliases

Source Name

Add new alias

Submit

Alias

Alias

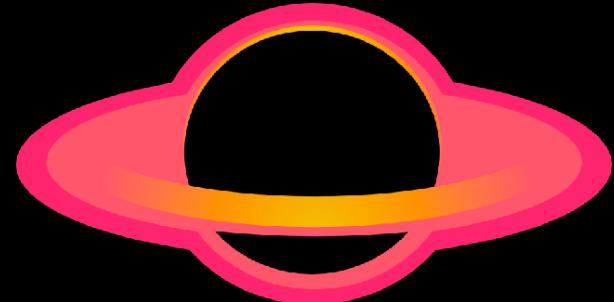
relative importance to other targets (0-10)

optimal observing cadence in days

names of the target in various surveys
(photometry data will be collected if available)

will be checked automatically for Ra,Dec
so leave it blank first and see what we find

you can also provide an url to the data



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,
lbg_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

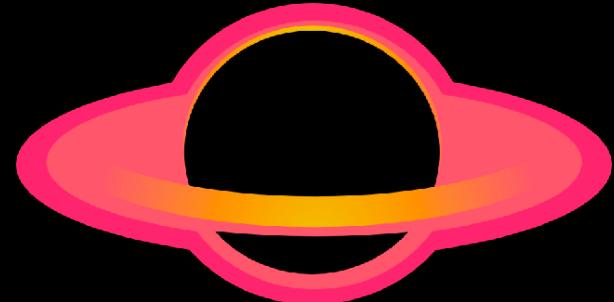
In these special cases, the Gaia Alerts harvester will gather all information from Gaia Alerts, but any extra columns in the CSV file with corresponding fields will replace those read from Gaia Alerts.

You can upload max 500 targets.

Group Name (optional):

Choose file No file chosen

Upload



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.

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.

Epoch

2000

Julian Years. Max 2100.

Classification

Quasar(QSO)

Description

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

Discovery date

2019-03-10 14:27:41

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

Importance

9,99

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

Cadence

1,0

Requested cadence (0-100 days)

pre-filled fields

pre-filled fields

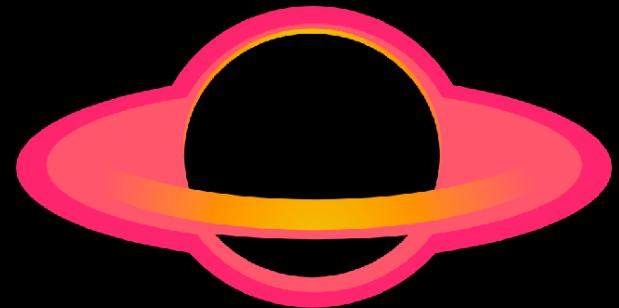
pre-filled fields

pre-filled fields

pre-filled fields

importance set to 9.99, but should be edited

cadence set to 1, but should be edited



target create

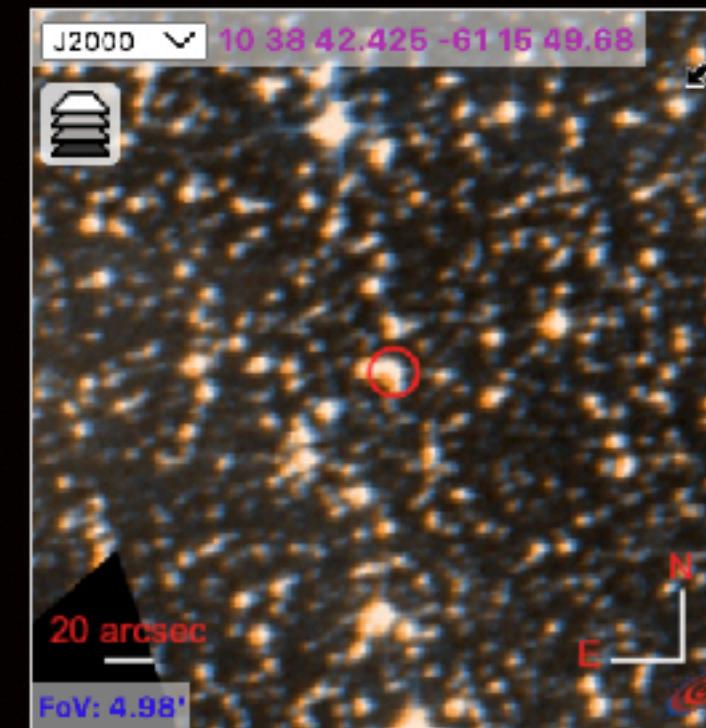
Target created, grabbing all the data for it. Please wait and refresh in about a minute...

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 9.99
(0-10)
Cadence requested 1.0
(d)

Other names:



Photometry

Models

Spectroscopy

Observe

Observations

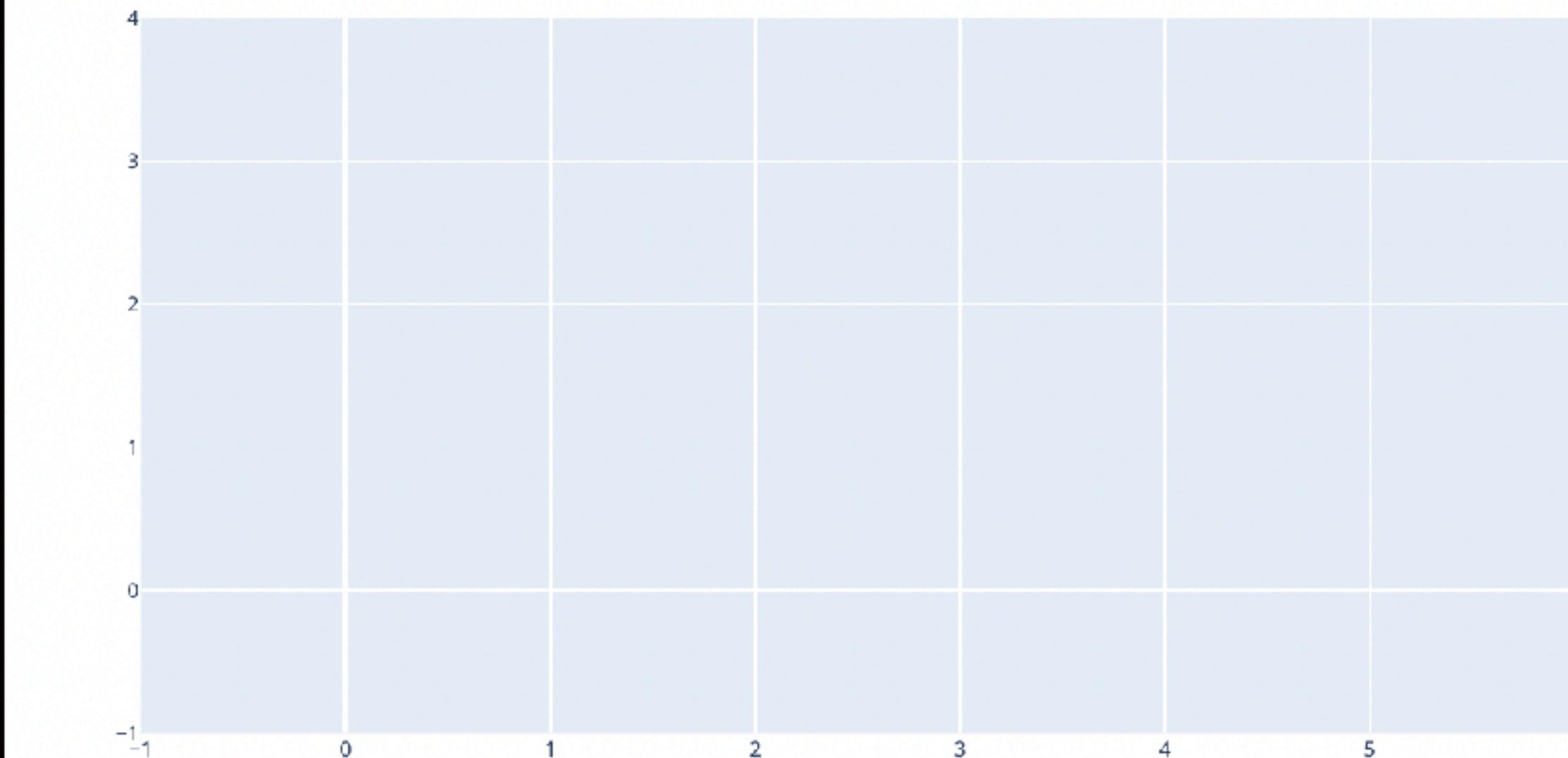
Publication

Manage Data

Manage Groups

[Check for new data](#)

Photometry



[Download photometry data](#)

[Download radio data](#)

Recent Photometry

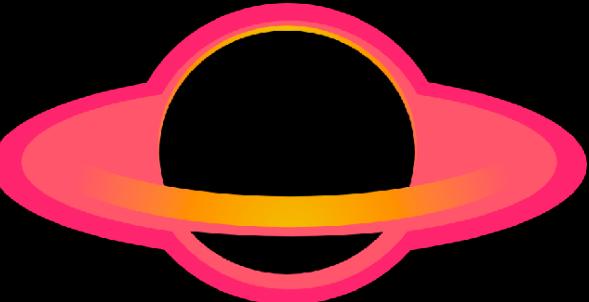
Timestamp

Magnitude

Filter

Facility

No recent photometry



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

target create

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	2023-08-28 13:08:29
Gaia22bpl	12.7100
GAIA_DR3	2023-08-28 11:08:54
5254100872645875968	12.7000
NEOWISE	2023-08-05 13:08:59
NEOWISE+J159.67677_-61.2638	12.7200
CRTS	2023-08-05 11:08:24
CRTS+J159.67677_-61.2638	12.7100
	2023-07-01 00:07:48
	12.7200

- [Photometry](#)
- [Models](#)
- [Spectroscopy](#)
- [Observe](#)
- [Observations](#)
- [Publication](#)
- [Manage Data](#)
- [Manage Groups](#)

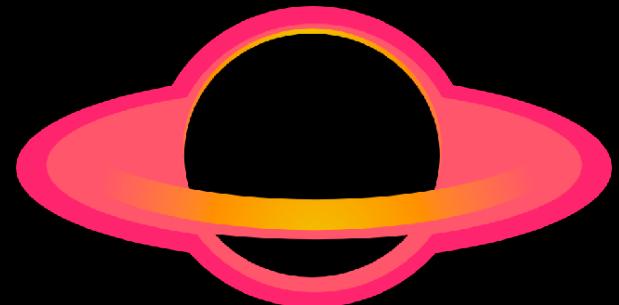
[Check for new data](#)

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 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			

Photometry

Check for new data

Download photometry data Download radio data

Recent Photometry

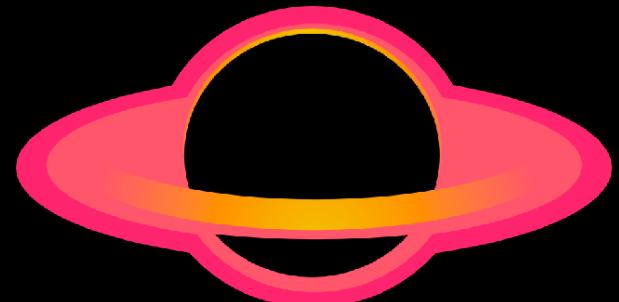
Timestamp	Magnitude	Filter	Facility
2023-08-28 13:08:29	12.7100	GSA(G)	Gaia Alerts
2023-08-28 11:08:54	12.7000	GSA(G)	Gaia Alerts
2023-08-05 13:08:59	12.7200	GSA(G)	Gaia Alerts
2023-08-05 11:08:24	12.7100	GSA(G)	Gaia Alerts
2023-07-01 00:07:48	12.7200	GSA(G)	Gaia Alerts

constellation

automatic classification

external links

external links



target detail

Gaia22bpl

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

Photometry

Check for new data

interactive plot

[Download photometry data](#)

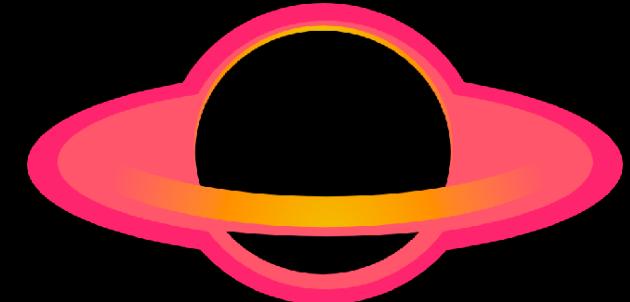
Recent Photometry

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

radio data download(if exists)

[Download radio data](#)

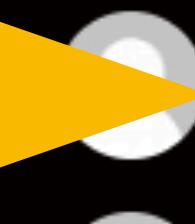
most recent photometry



target detail - comments

Comments

created automatically



Lukasz Wyrzykowski on 2024-03-20

Target created by Lukasz Wyrzykowski(wyrzykow) on 2024-03-20 11:01:11.914539+00:00



Lukasz Wyrzykowski on 2024-03-20

It seems the increase in WISE (NIR) happens way before the one in the optical (Gaia). Weird! It might be a sign this is not microlensing, as in microlensing we would expect all bands rising simultaneously (unless there is strong blending in the optical and not so severe in NIR). Curious! Let's observe this one and we will see.



siegfried Vanaverbeke on 2024-03-25

it is therefore still worth observing.



Lukasz Wyrzykowski on 2024-05-06

A spectrum from the North would be useful. LT/INT?



Lukasz Wyrzykowski on 2024-11-15

LT/SPRAT submitted for window 15/11/2024 - 15/12/2024, blue grating, 1x20s.



Comment

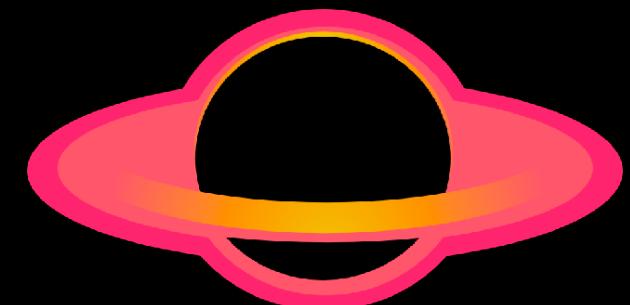
Comment

add info how do you want your target to be observed

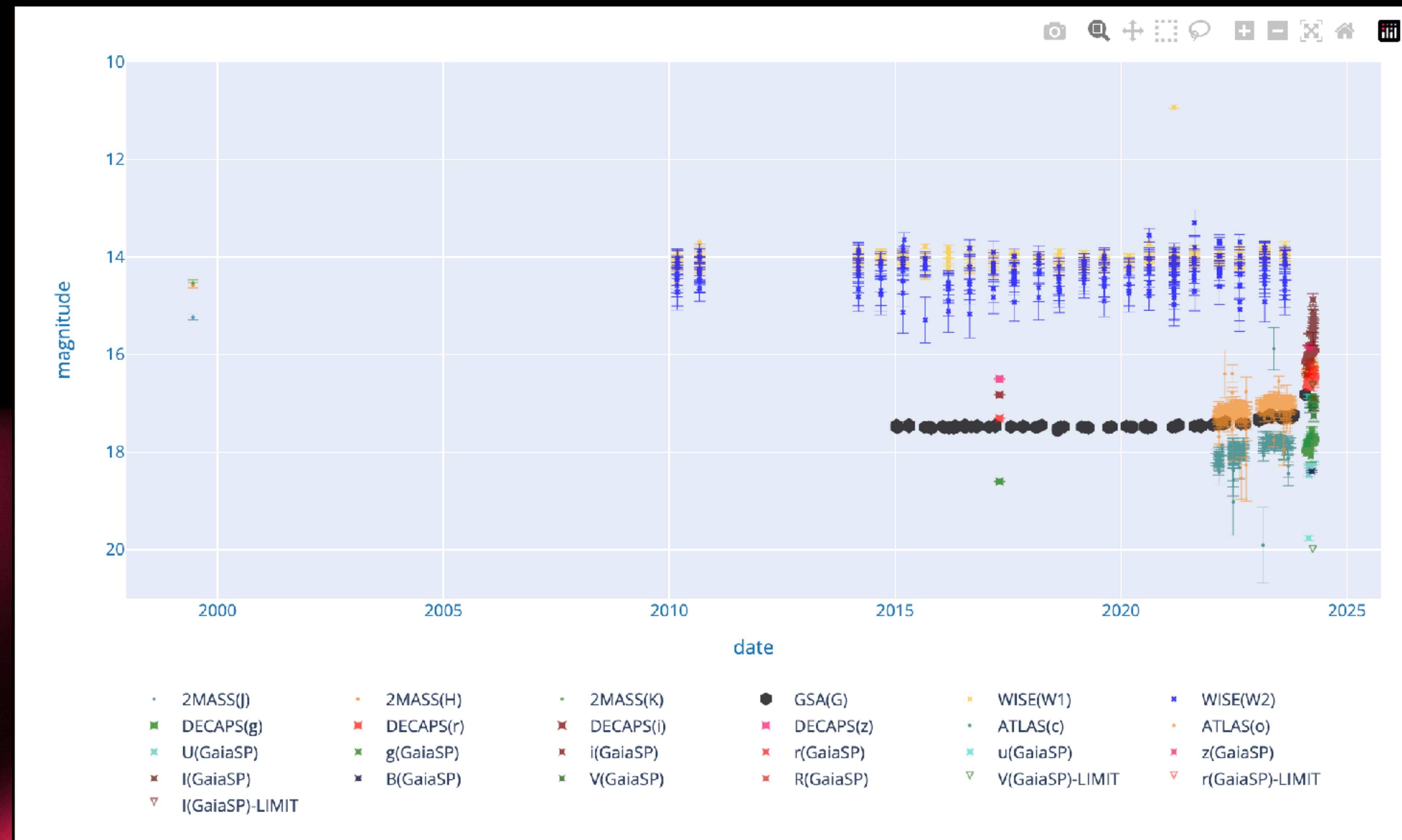
add any references to existing data or papers

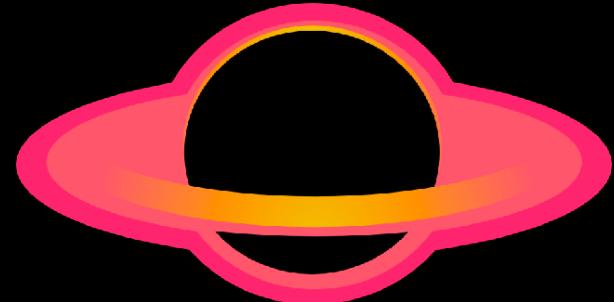
discuss with others, request spectra, etc.

Post

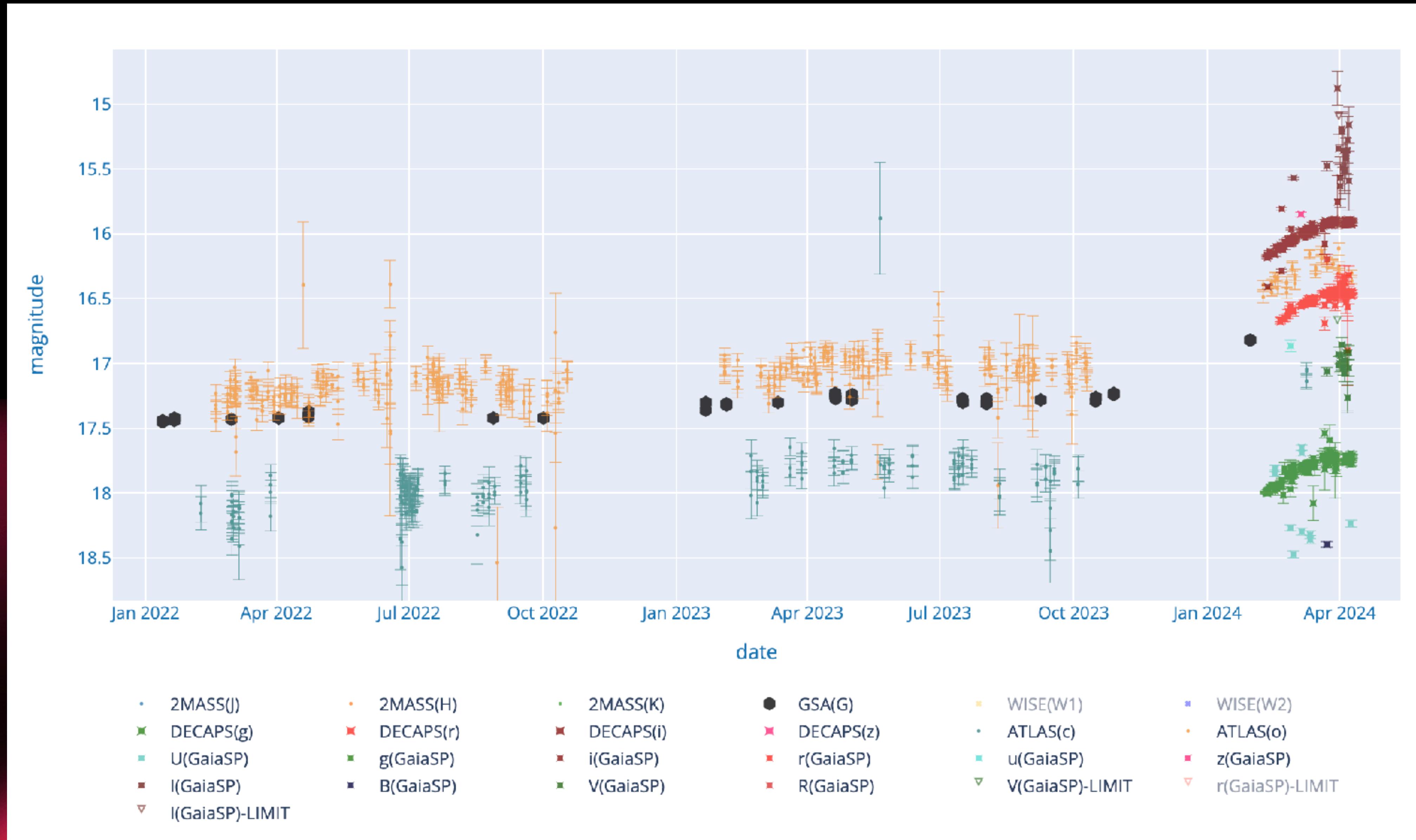


target light curve - per filter

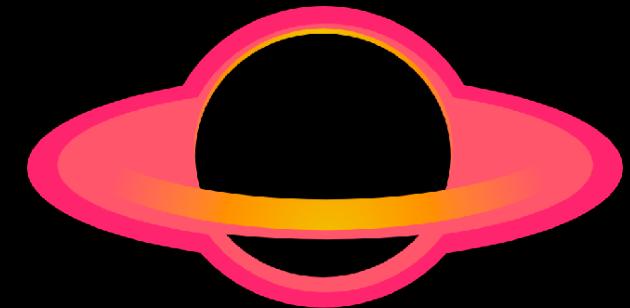




target light curve - per filter



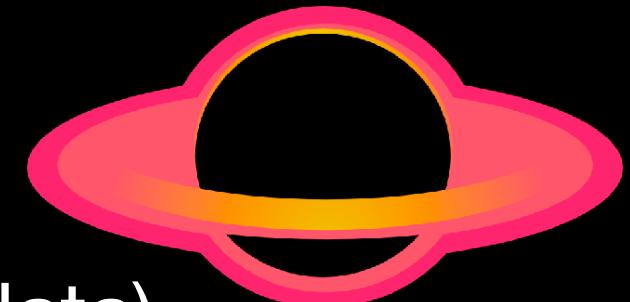
Gaia24amo



target light curve - per facility

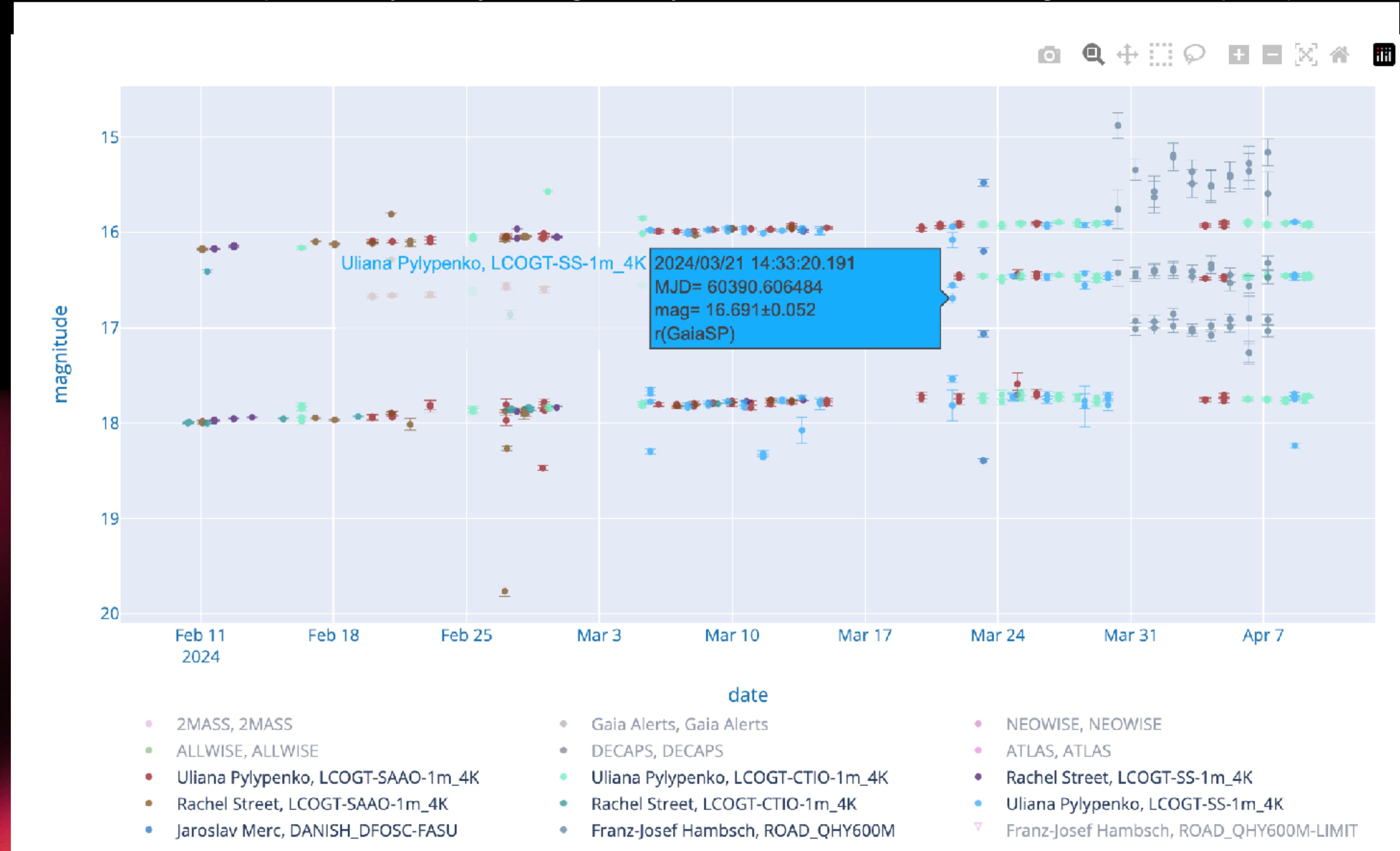


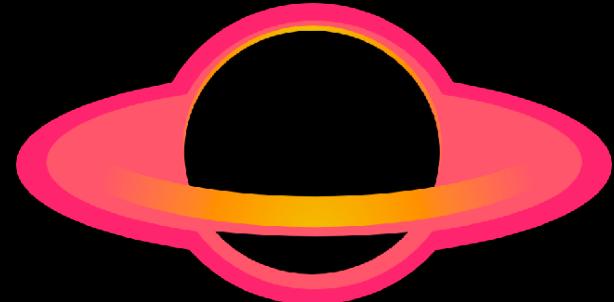
Gaia24amo



target light curve - per facility

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





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 [Spectroscopy](#) [Classification](#) [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!

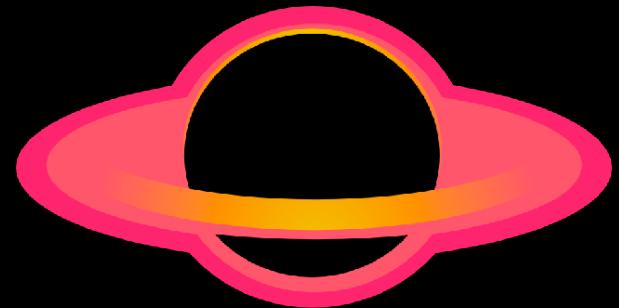
Comments

No comments yet.

Comment

Comment

[Post](#)



models – separate interactive window

Microlensing model for Gaia22bpl

Gravitational microlensing model using MulensModel (Poleski&Yee 2018)

Fit initial values:

t_0 : 2459749.048410 u_0 : 0.129032 t_E : 60.00000 $\log u_0$: fixblending:

auto_init:

Available filters and number of datapoints:

Select All Deselect All

GSA(G) 129

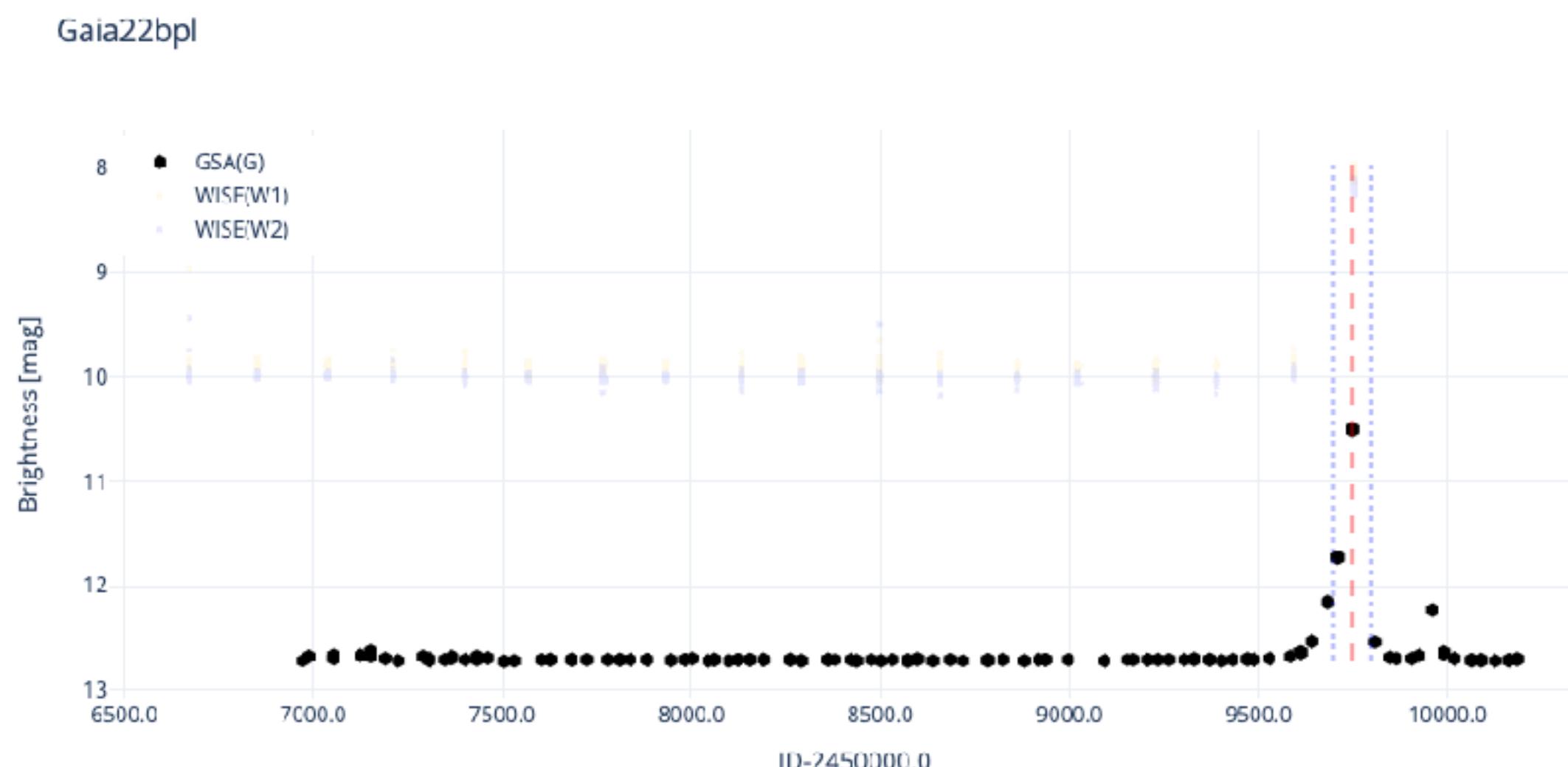
WISE(W1) 387

WISE(W2) 387

MODEL

parameter init

interactive data selection



models Application Manage Data Manage Groups

microlensing model, single lens, single source, no parallax

Fitted parameters

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

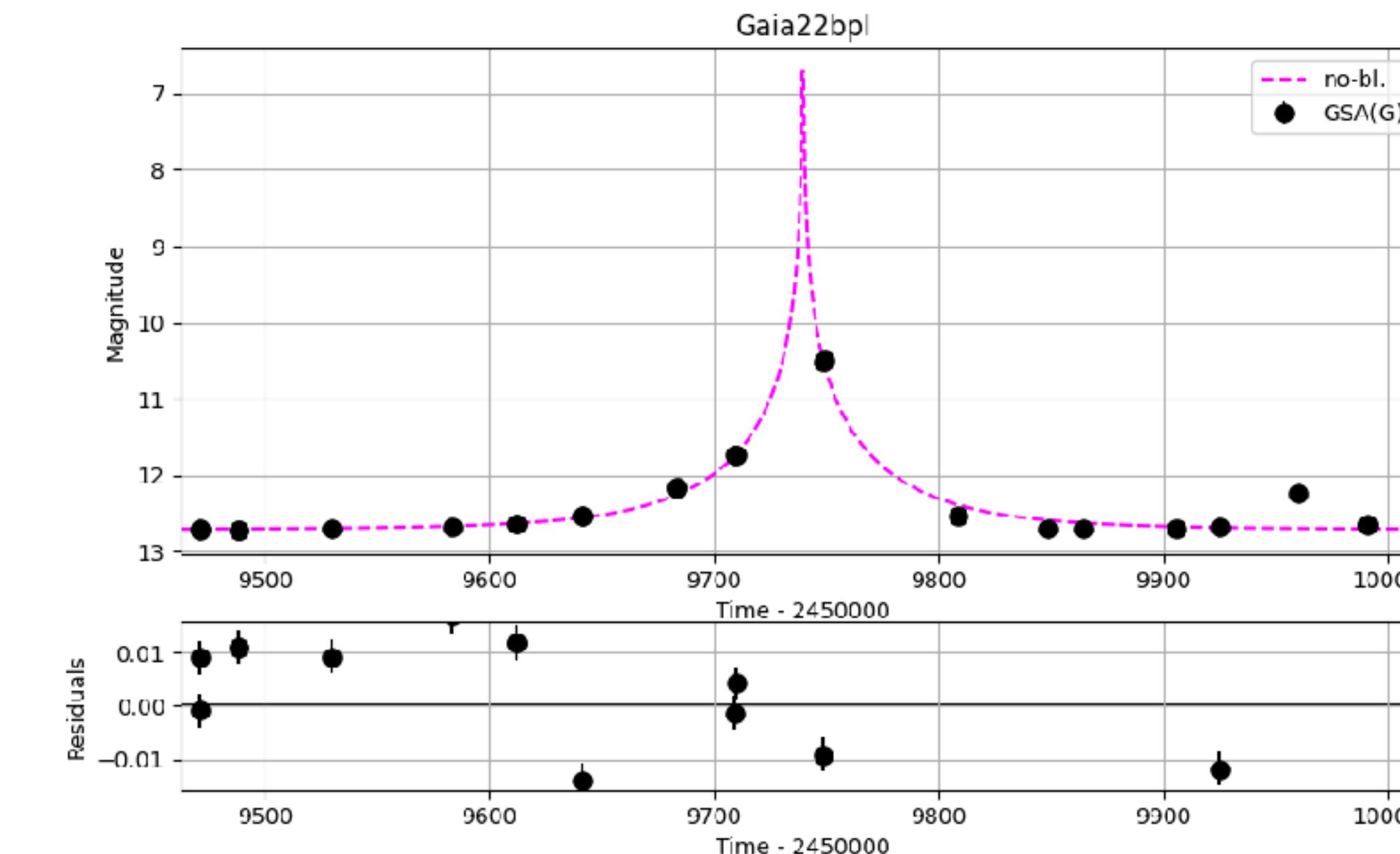
$\text{Chi}^2 = 23120.64$ $\text{Chi}^2/\text{ndof} = 183.50$

Filter Mag0 FS

GSA(G) 12.708 1.0

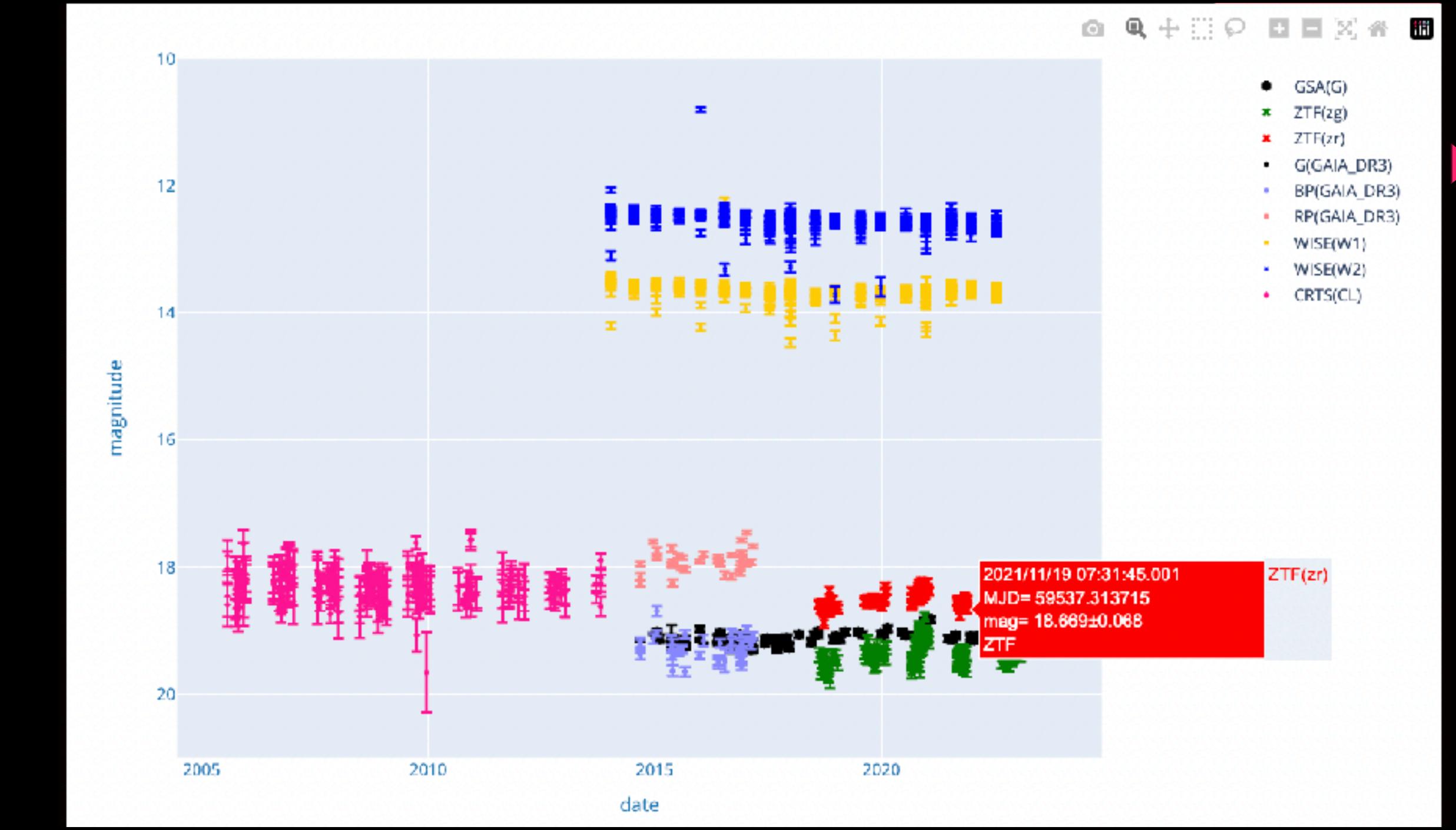
Fitted light curve

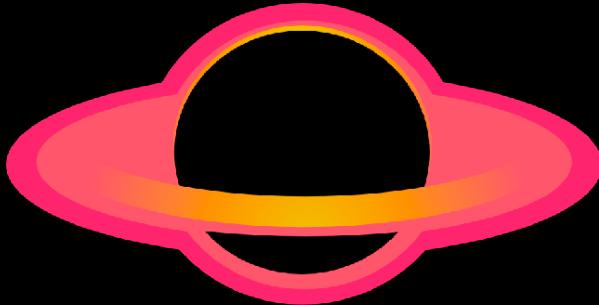
model results



archives (via brokers)

- Gaia Science Alerts (2014+)
- 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
- IR: 2MASS, ALLWISE + NEOWISE (2010+)
- FIRST and LOFAR (radio)
- ATLAS (South+North)
- OGLE EWS
- will be added:
 - + OGLE variable stars
 - + DASH Harvard photographic plates (<1900)





publication

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

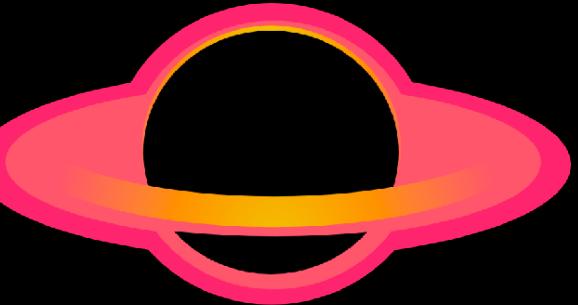
Photometry Models Spectroscopy Observe Observations Publication Manage Data Manage Groups

[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](#)



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

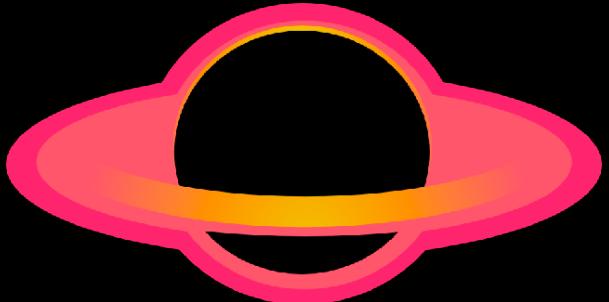
Force filter

GaiaSP/any

Comment

Comment

Upload



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 included in your list. 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 observatories. 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 telescope / 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.

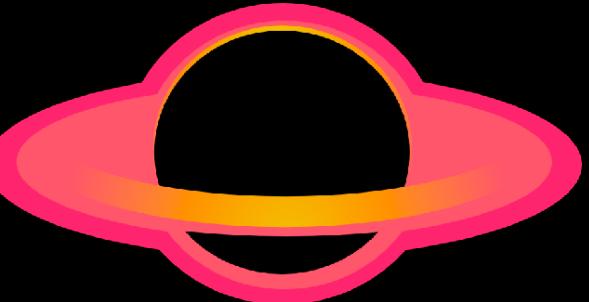
Observatory

Comment

Comment:

[Add to my list](#)

[Create new Observatory](#)



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]*

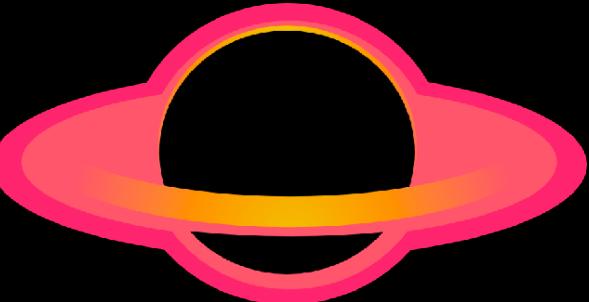
0.0

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

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

this will require human acceptance

Create Observatory



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

List of observatories

List of your registered observatories/instrument
Here you can add a new observatory to your list
different instrument (e.g. CCD) on the same tele

	Favorite Observatories	Observatories
	Add new observatory	
Auger FRAM 30-cm	-69.449755	35.496138
Białków 60-cm	16.657822	51.47425
Cassegrain Telescope		
CAHA 1.23-m	-2.5458	37.2208
Telescope		
CASLEO HSH 60-cm	-69.306638	-31.7873
FRAM_G4		FRAM (F/Photometric Robotic A...
BIAŁKOW_ANDOR-DW432		Biały station, Wrocław Univ...
		Observatory website: https://...
		False
		Details Edit Delete
		Update observatory
		Readout Speed [microseconds/pixel]
		9999,0

Add new camera

Add Camera

Update

Cameras

Observatory(ONAME): REM_ROS2

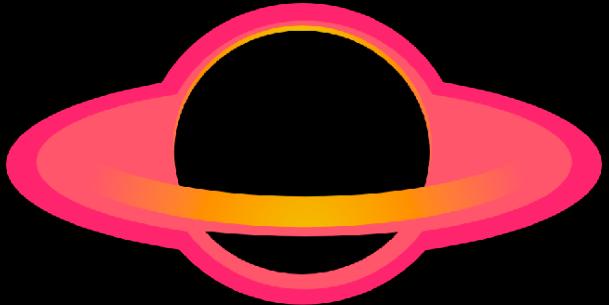
Camera Name: ROS2 instrument
Gain: 1.0
Pixel Scale: 0.581

Example File: IMG20190101_100000.FITS
Readout Noise: 4.5
Pixel Size: 13.5

Observatory(ONAME): REM_REMIR

Camera Name: REMIR instrument
Gain: 5.0
Pixel Scale: 1.221

Example File: Gaia2
Readout Noise: 100
Pixel Size: 18.5



upload – uploading fits images

pre-requisites:

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

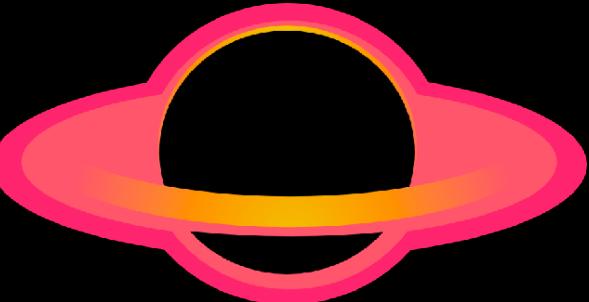
Gaia24ayd

Name	Gaia24ayd
Ra,Dec	300.82509 30.65126 20:03:18.022 +30:39:04.536
Galactic (l,b)	68.012377 -0.211674
Constellation	Cygnus
Discovered	2024-03-12 13:39:39
Class	Unknown

Photometry Models Spectra in target page, find Manage Data 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-2400000.5) 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](#)



upload – uploading fits images

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

Choose a 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)

Observer's Name *

Observatory*

Camera*

Force filter

Comment

select this →

modify if needed →

select your telescope →

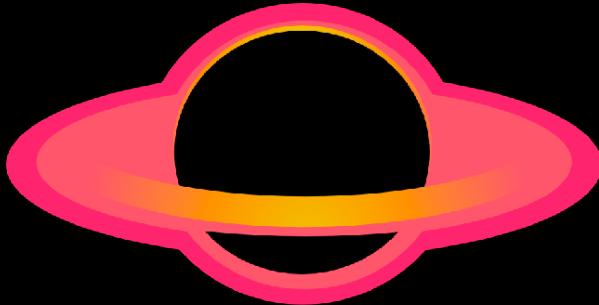
select your camera →

leave GaiaSP/any* →

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

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



upload – uploading SExtractor photometry

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

select this →

Choose a 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 *

Observer's Name *

Lukasz Wyrzykowski

Observatory*

REM 60-cm Telescope

Camera*

ROS2 instrument

Force filter

GaiaSP/any

Comment

Comment

Upload

obligatory! →

modify if needed →

select your telescope →

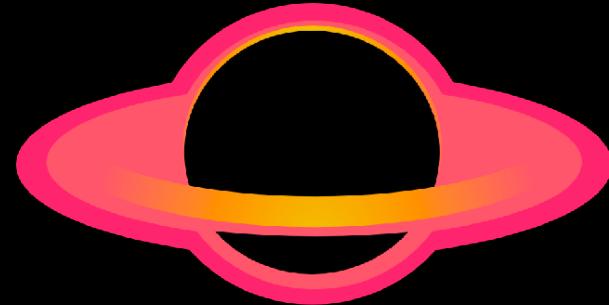
select your camera →

leave GaiaSP/any* →

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e.g. on the conditions, weather,
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API

docs.bhtom.space

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

BHTOM2 API Documentation

Introduction

This is a simple guide for BHTOM's REST API. It lets you use BHTOM webpage features in your own programs. You can get a list of targets, add observations, download data and more. Let's get started!

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

Copy Token to Clipboard

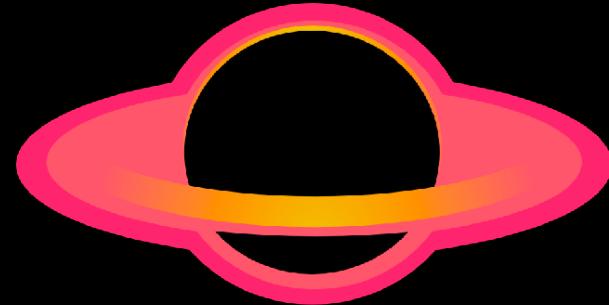
User name*

wyrzykow

First name*

Lukasz

Token now can be copied from your profile page



API

docs.bhtom.space

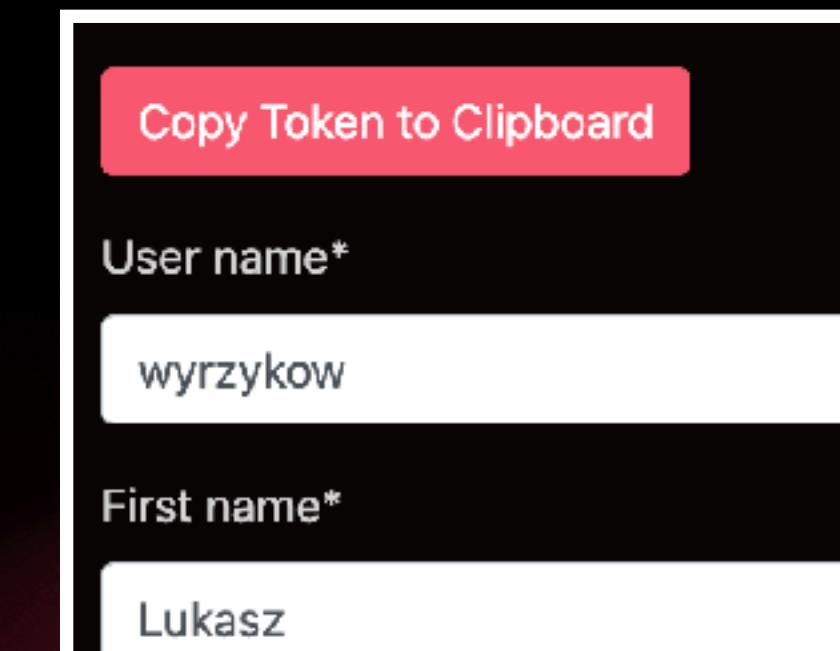
- all functionalities of BHTOM available programmatically!
- upload (fits, dat, spec)
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Copy Token to Clipboard

User name*

wyrzykow

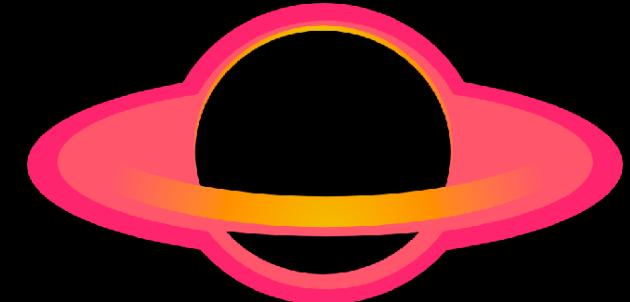
First name*

Lukasz

Token now can be copied from your profile page

BHTOM API Example Notebooks:

https://drive.google.com/drive/folders/1A9Oe1rApyl7_ orazo_1oUNVqdzhE-w4M?usp=sharing



BHTOM Newsletter

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

BHTOM Targets for 08 April, 2024 0 views



Lukasz Wyrzykowski <wyrzykow@gmail.com>

to bhtomtargets@googlegroups.com

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



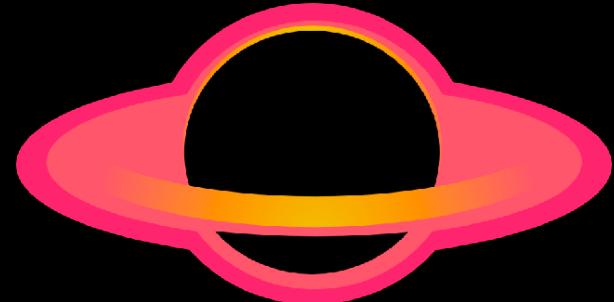
Hello,

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.



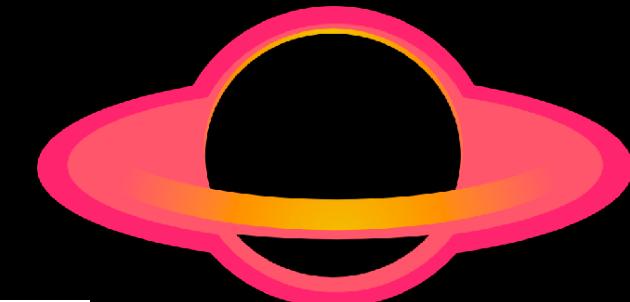
BHTOM Newsletter

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

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	recurrent 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

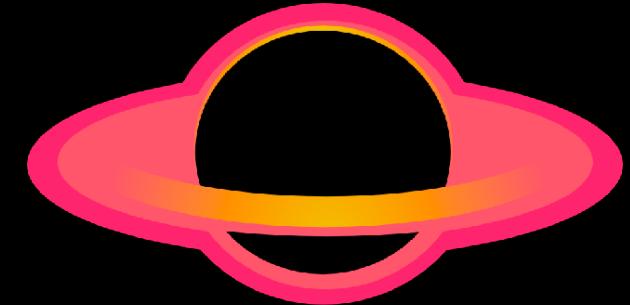


BHTOM Newsletter

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

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

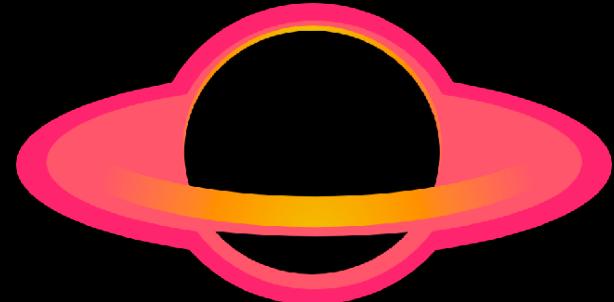


BHTOM Newsletter

<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, Gaia23cwl, 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



BHTOM Newsletter

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

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 Ihaneč (LCOGT-CTIO-1m_4K) 89
Uliana Pylypenko (LCOGT-CTIO-1m_4K) 87
Nada Ihaneč (LCOGT-SAAO-1m_4K) 58
Staszek Zola (OAUJ-CDK500_U47) 47
Alexios Liakos (Kryoneri-1.2_Andor-Zyla) 40
Jan Kåre Trandem Qvam (HA068_G2-1600) 37
Nada Ihaneč (LCOGT-Teide-1m_4K) 35
Nada Ihaneč (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 Ihaneč (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
Przemysław J. Mikolajczyk (ASV60_FLI) 1



enjoy bhtom2 !



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