

BHTOM GLOBAL NETWORK OF TELESCOPES

- A RESEARCH INFRASTRUCTURE FOR TIME-DOMAIN ASTRONOMY

Łukasz Wyrzykowski
(pron. Woo-cash Vi-zhi-kov-ski)



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University of Warsaw, Poland**

**National Centre for Nuclear
Research, Warsaw, Poland**



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collaborators

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Heidelberg University



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Krzysztof Kotysz
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Mariusz Gromadzki
(postdoc)



Milena Ratajczak
(postdoc)



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(PhD student)

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(postdoc)



Katarzyna Kruszyńska
(postdoc)



Nada Ihanec
(PhD student)



Algita Stankevičiūtė
(PhD student)



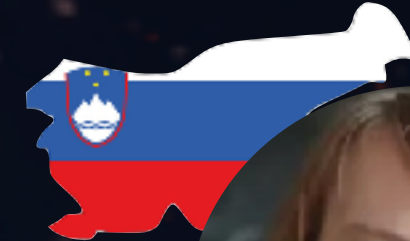
Kornel Howil
(BSc student)



Uliana Pylypenko
(MSc student)

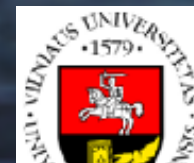


Marius Maskoliūnas
and his group

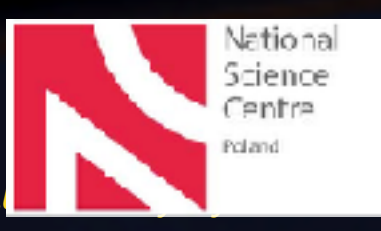


Andreja Gomboc
and her group

Former contributors: Maja Jabłońska, Piotr Trzcionkowski, Kacper Raciborski, Monika Sitek



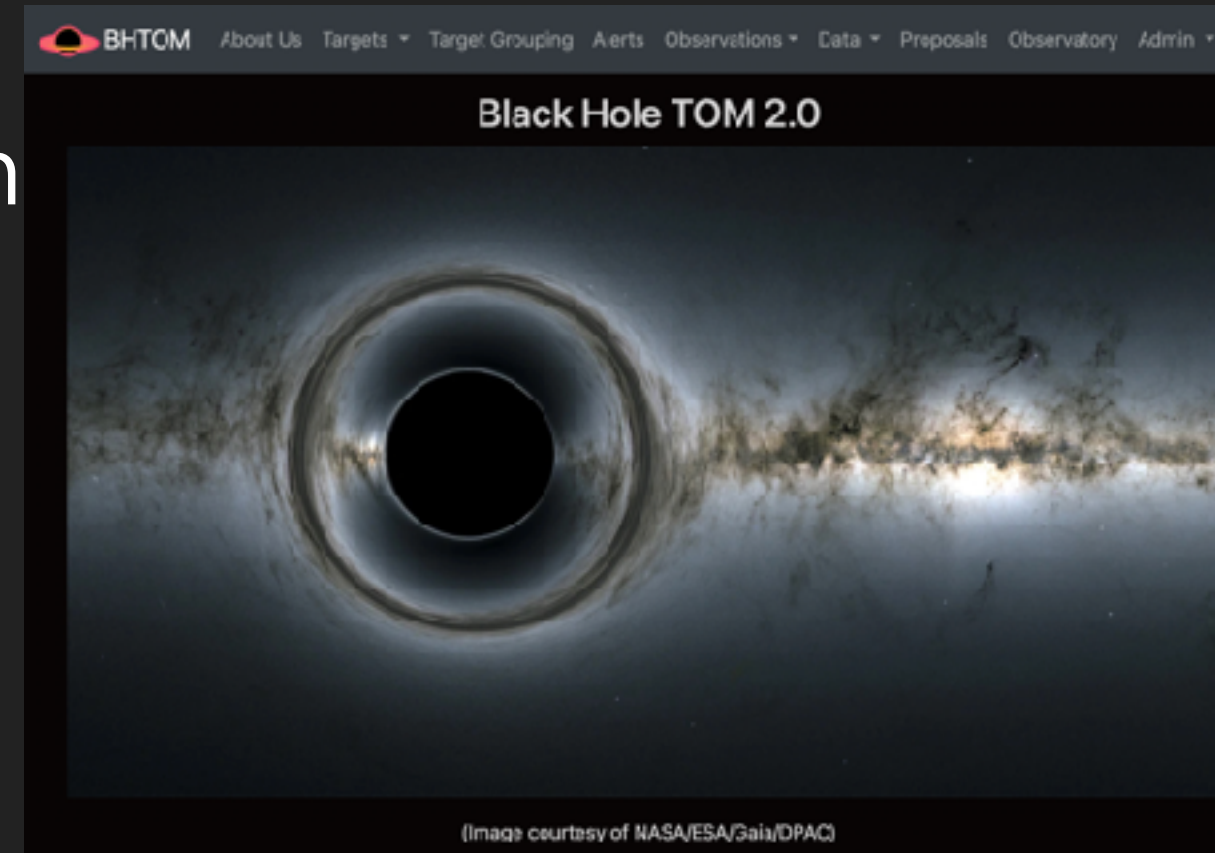
Funding:



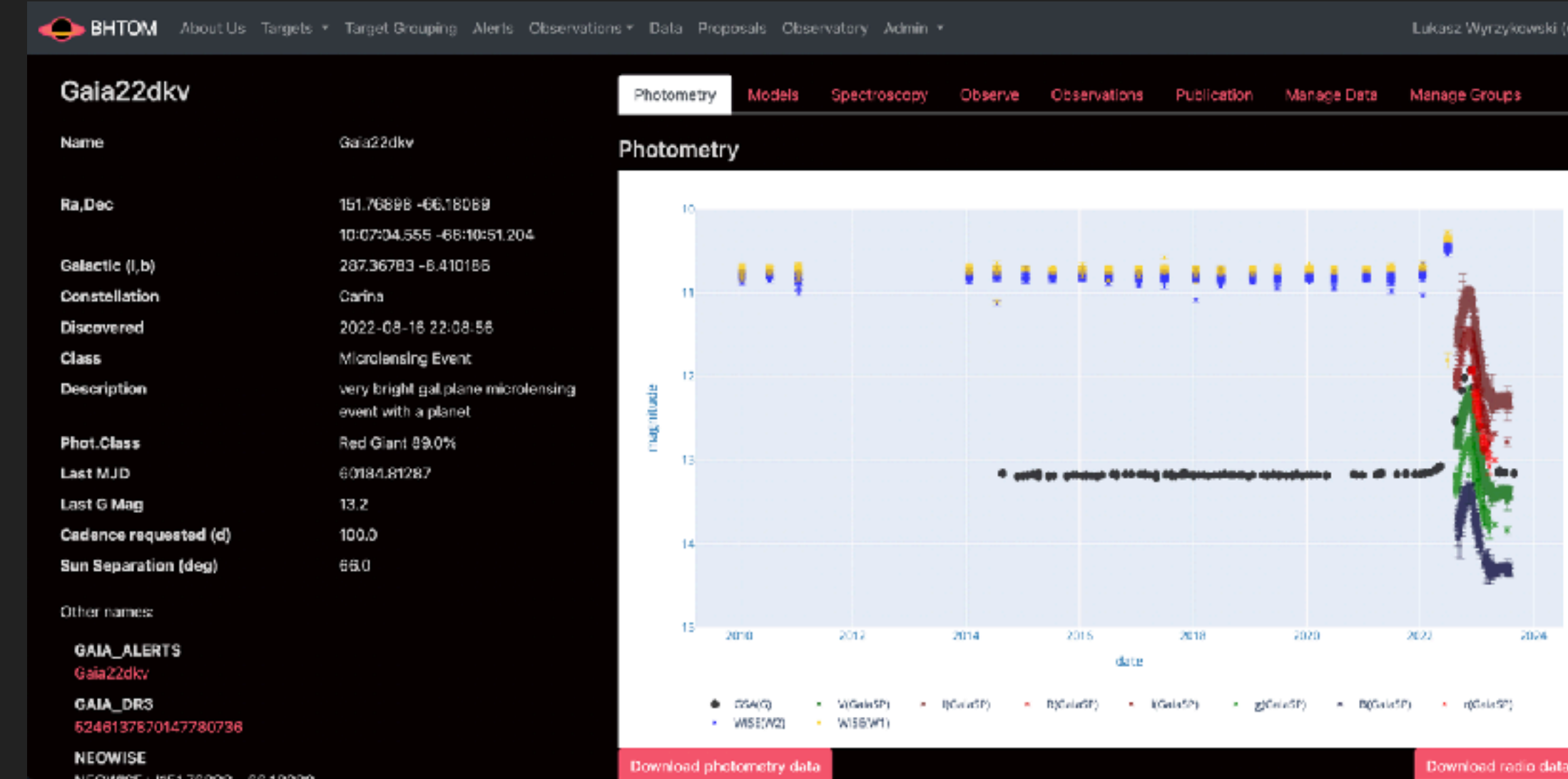


BLACK HOLE TARGET AND OBSERVATION MANAGER (BHTOM)

- ▶ web tool for coordination for time-domain observation
- ▶ automated observation requests
- ▶ processing of raw images from heterogenous units
- ▶ automated standardisation
- ▶ archival multi-wavelength time-domain photometry
- ▶ open for new users, new telescopes, new targets!

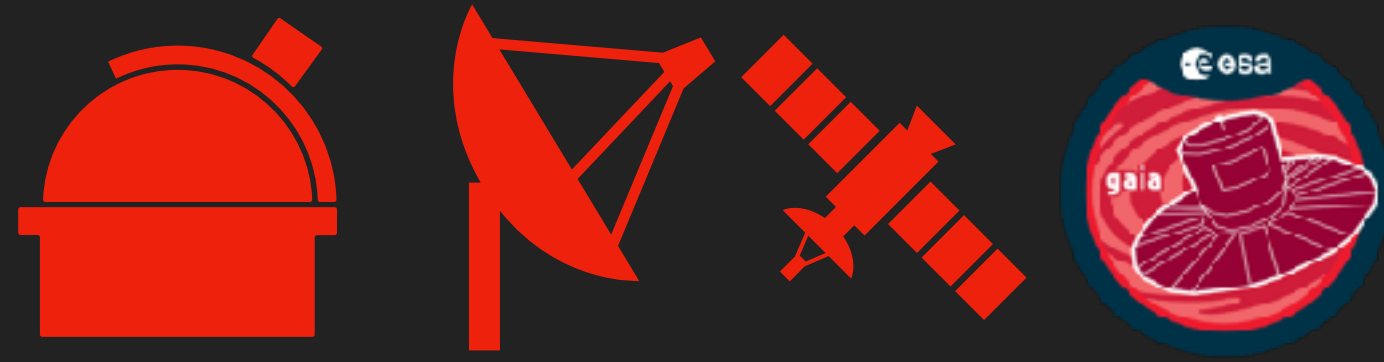


Names	RA	Dec	Nobs	Last Gmag	Last Filter	Importance	Created	Priority	Sun	Class
Gaia1Bacc	22:05:42.324	+03:39:17.064	982	20.2	Gaia/r	9.99	2023-09-18 10:09:17	799.0	155	long_period_variable
Gaia22bpl	10:38:42.425	-61:15:49.680	903	12.7	Gaia/r	9.99	2023-09-18 10:09:48	208.6	64	microlensing_event
Gaia22awa	19:04:51.962	-08:34:00.660	1602	15.0	Gaia/r	9.99	2023-09-17 21:09:11	770.1	111	microlensing_event
ZTF19abflrit	18:24:23.314	-24:36:42.053	842	15.2	Gaia/r	0.0	2023-09-19 11:09:02	0.0	100	long_period_variable



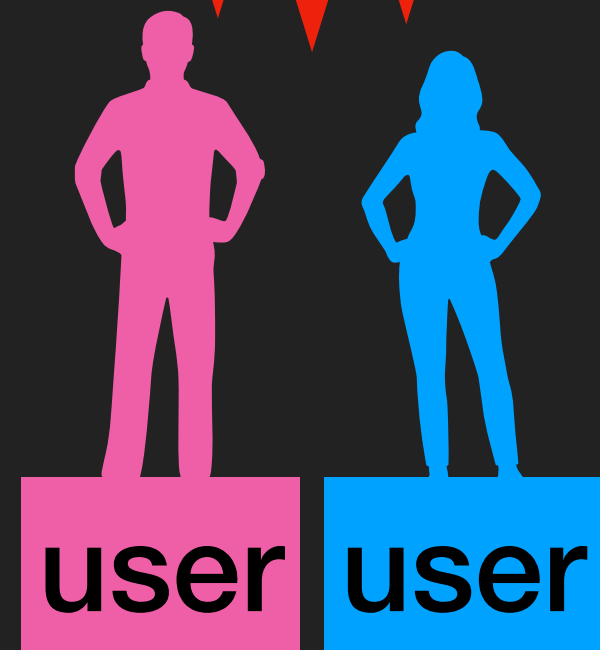
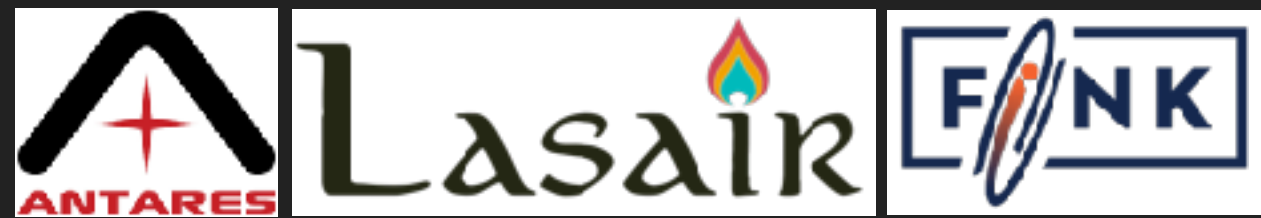
Surveys

Gaia,
ZTF,
OGLE,
ASAS-SN,
LSST,



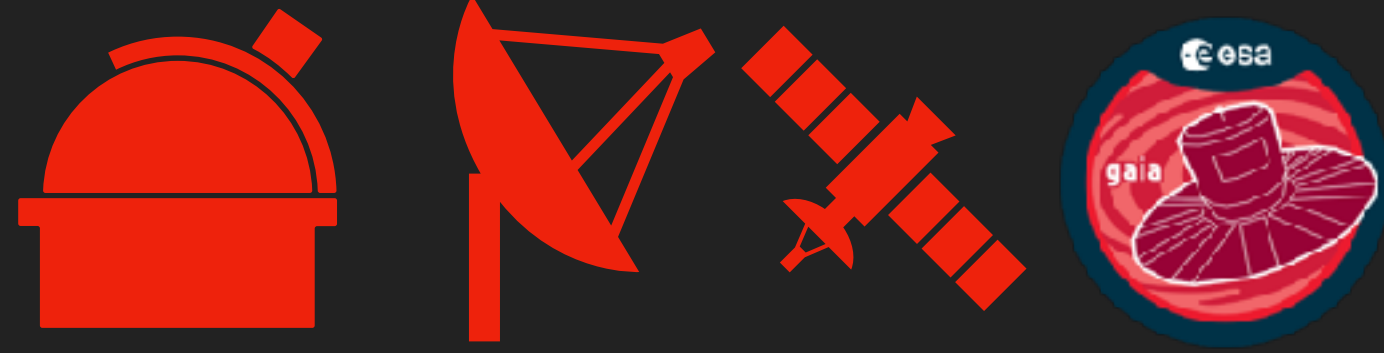
Alerts

Brokers



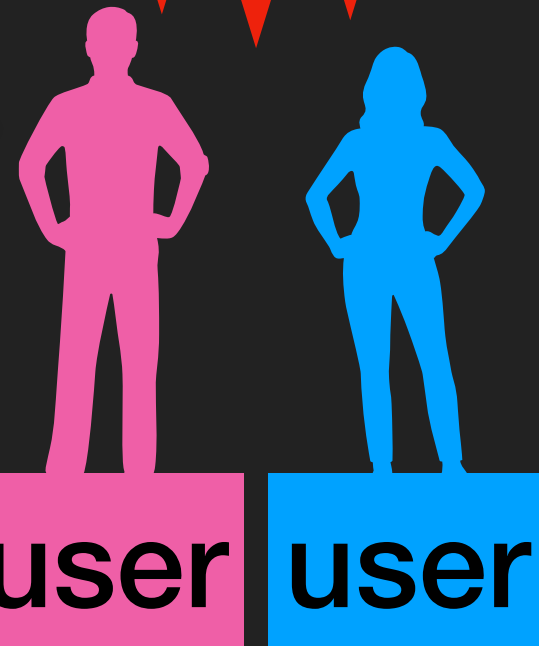
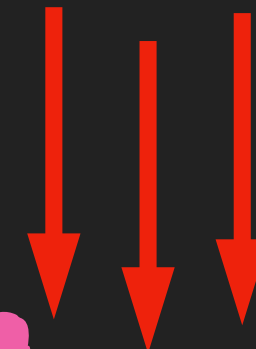
Surveys

Gaia,
ZTF,
OGLE,
ASAS-SN,
LSST,



Alerts

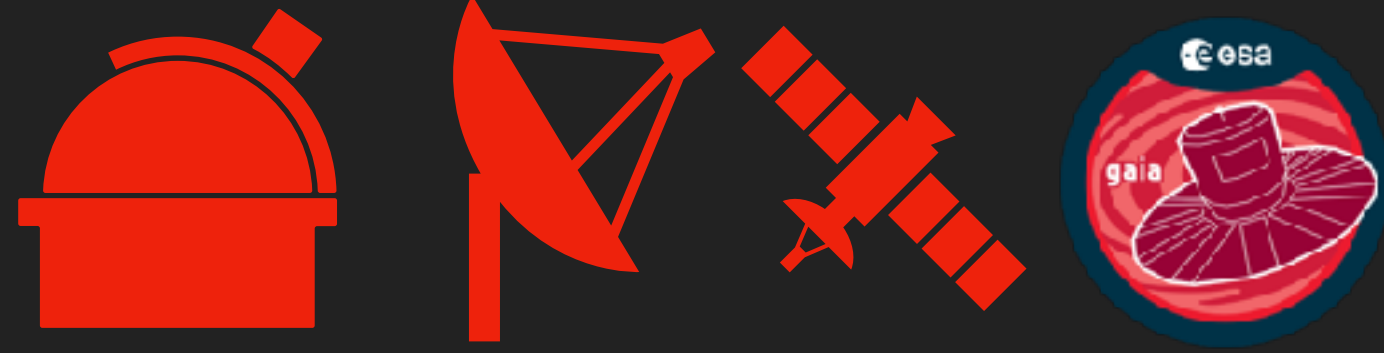
Brokers



There are
10 candidates for
GW optical
counterparts!

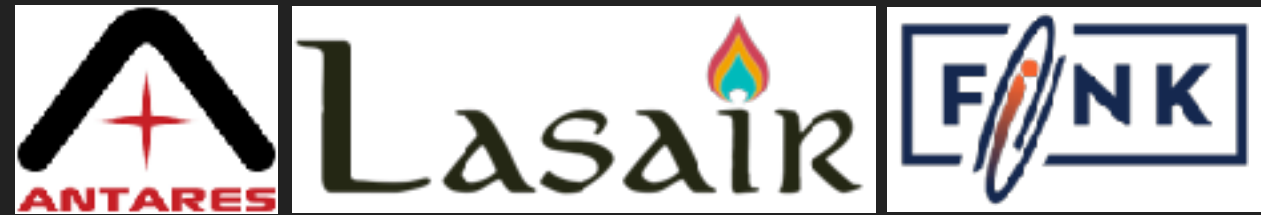
Surveys

Gaia,
ZTF,
OGLE,
ASAS-SN,
LSST,

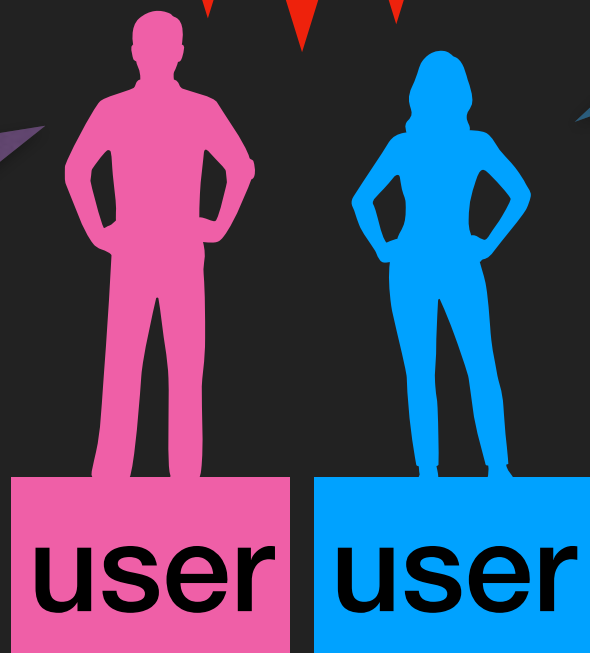


Alerts

Brokers



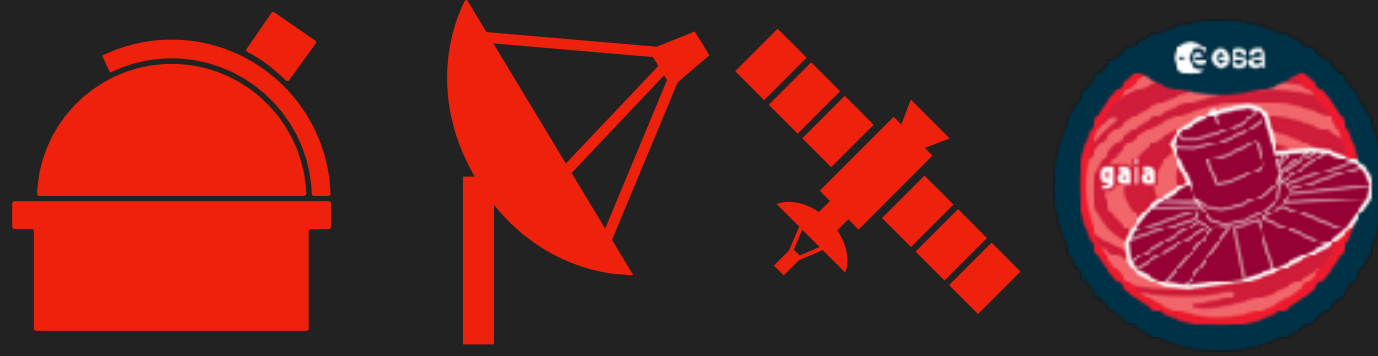
please
observe Gaia20fnr
event for 1 year



There are
10 candidates for
GW optical
counterparts!

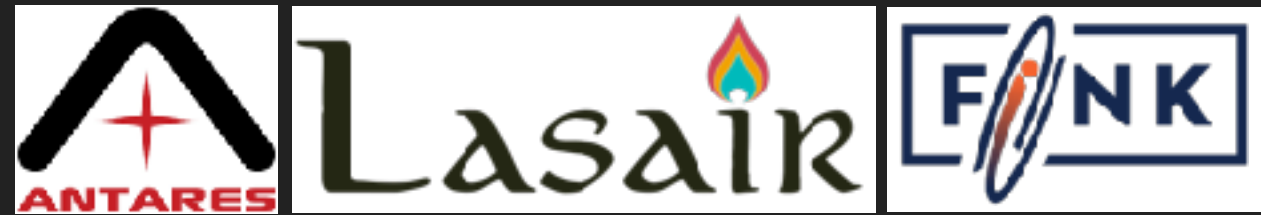
Surveys

Gaia,
ZTF,
OGLE,
ASAS-SN,
LSST,



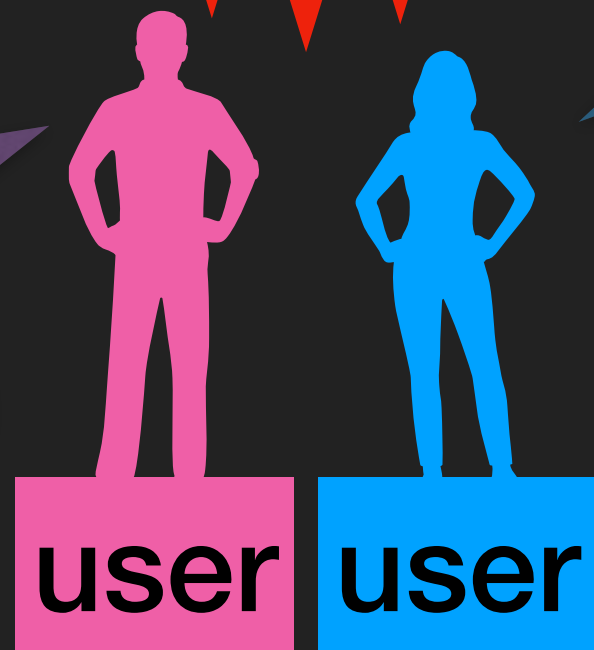
Alerts

Brokers



please
observe Gaia20fnr
event for 1 year

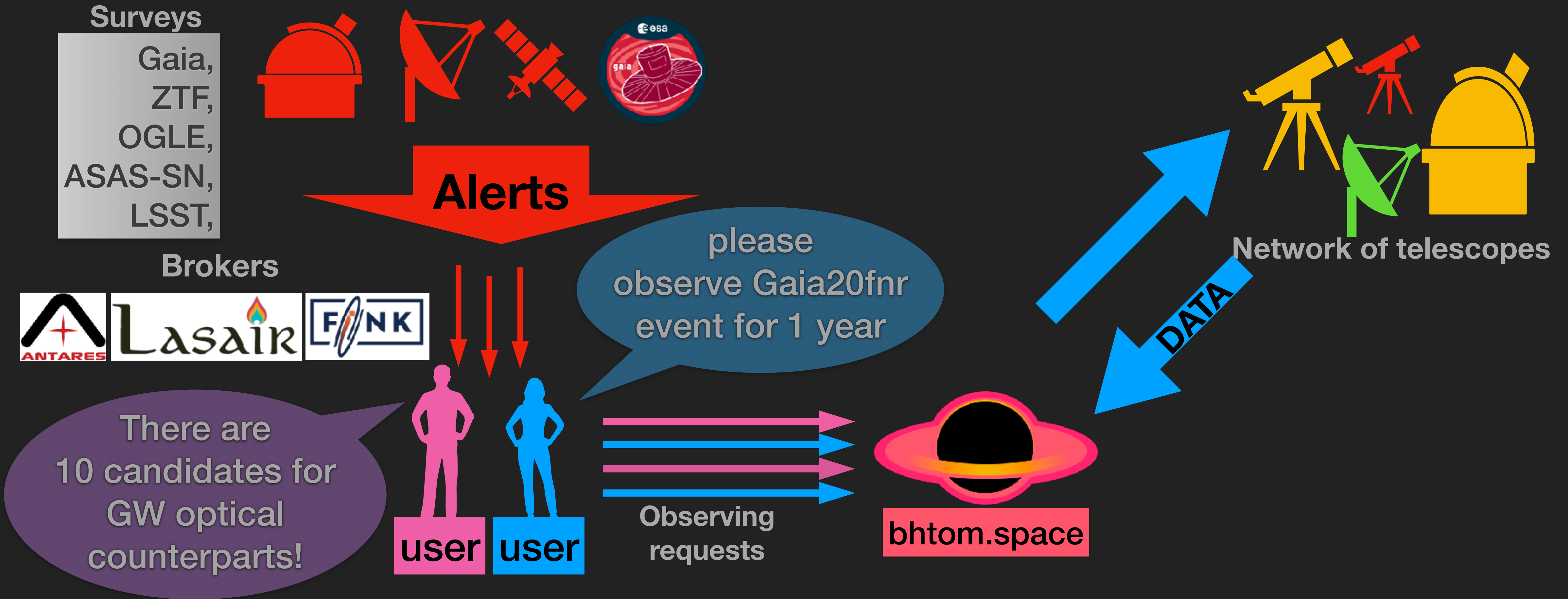
There are
10 candidates for
GW optical
counterparts!

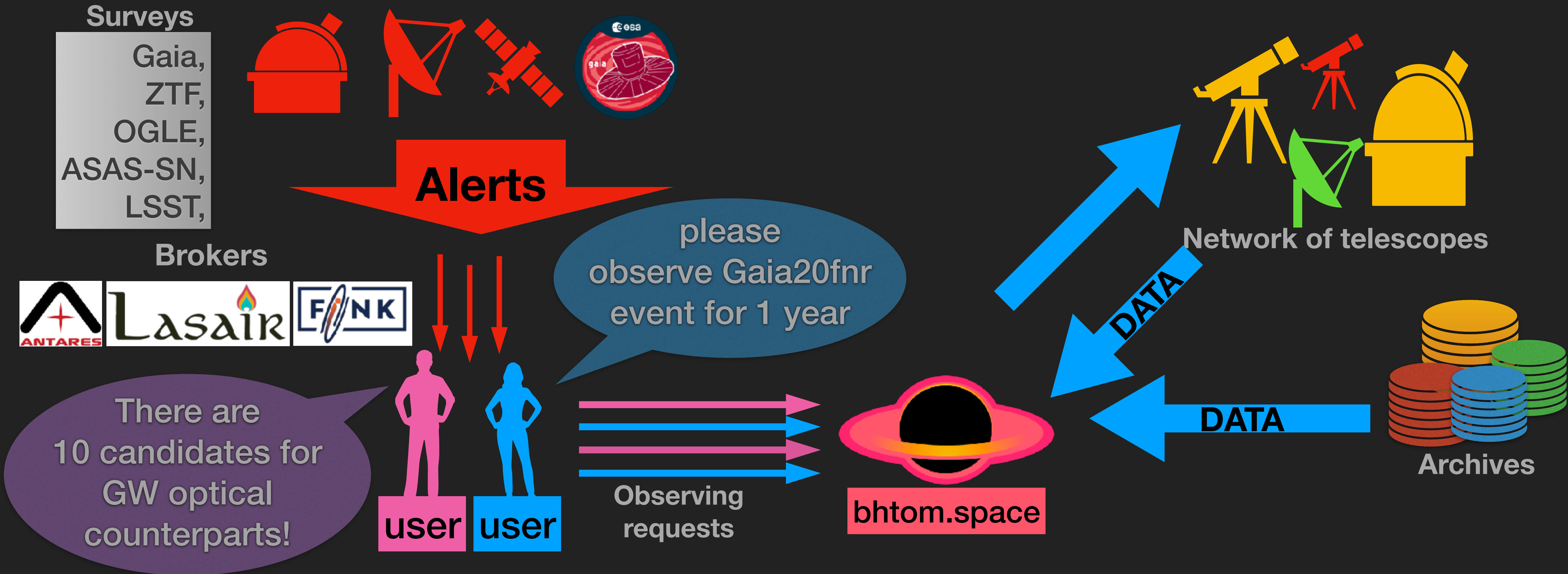


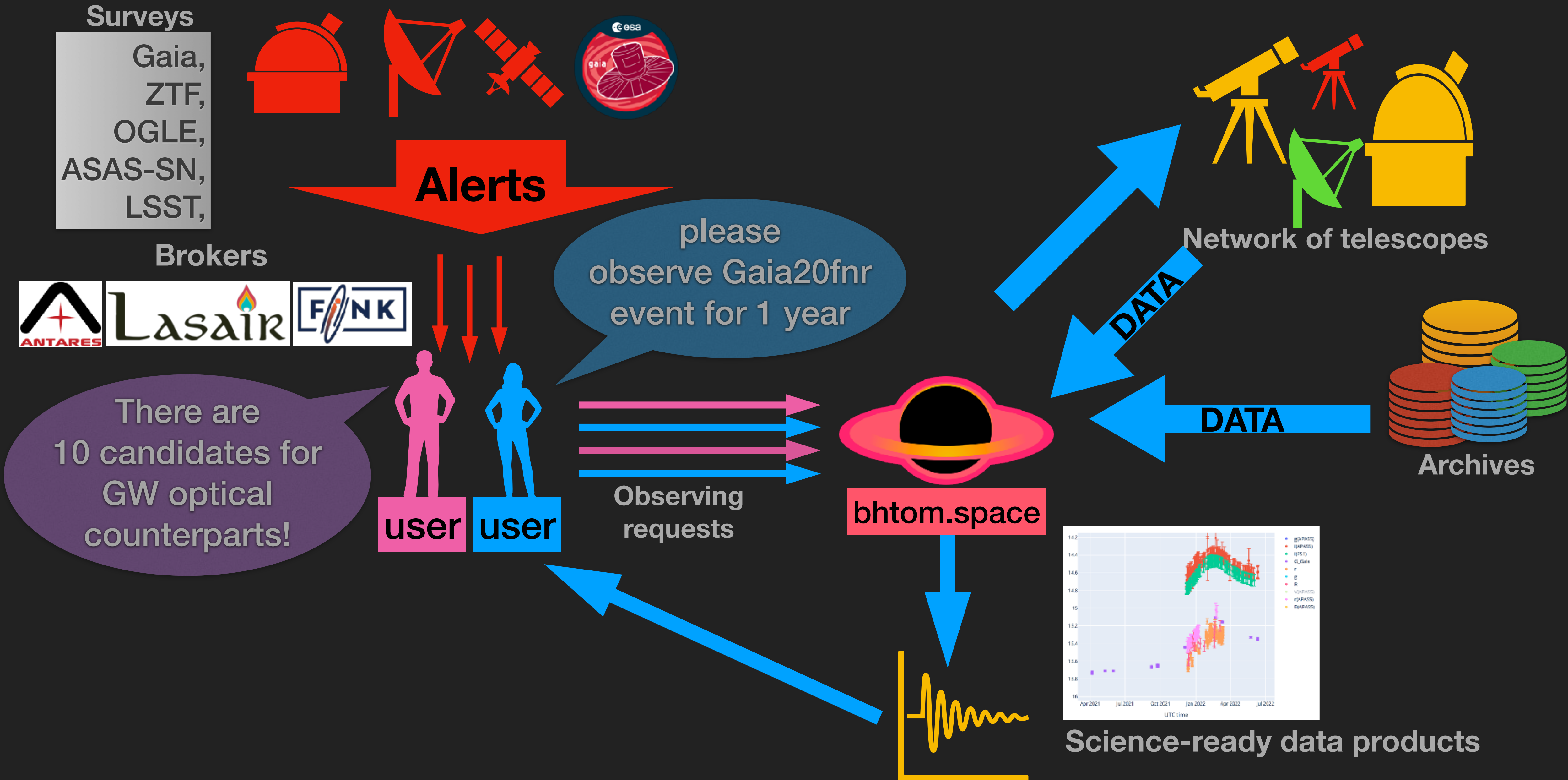
Observing
requests

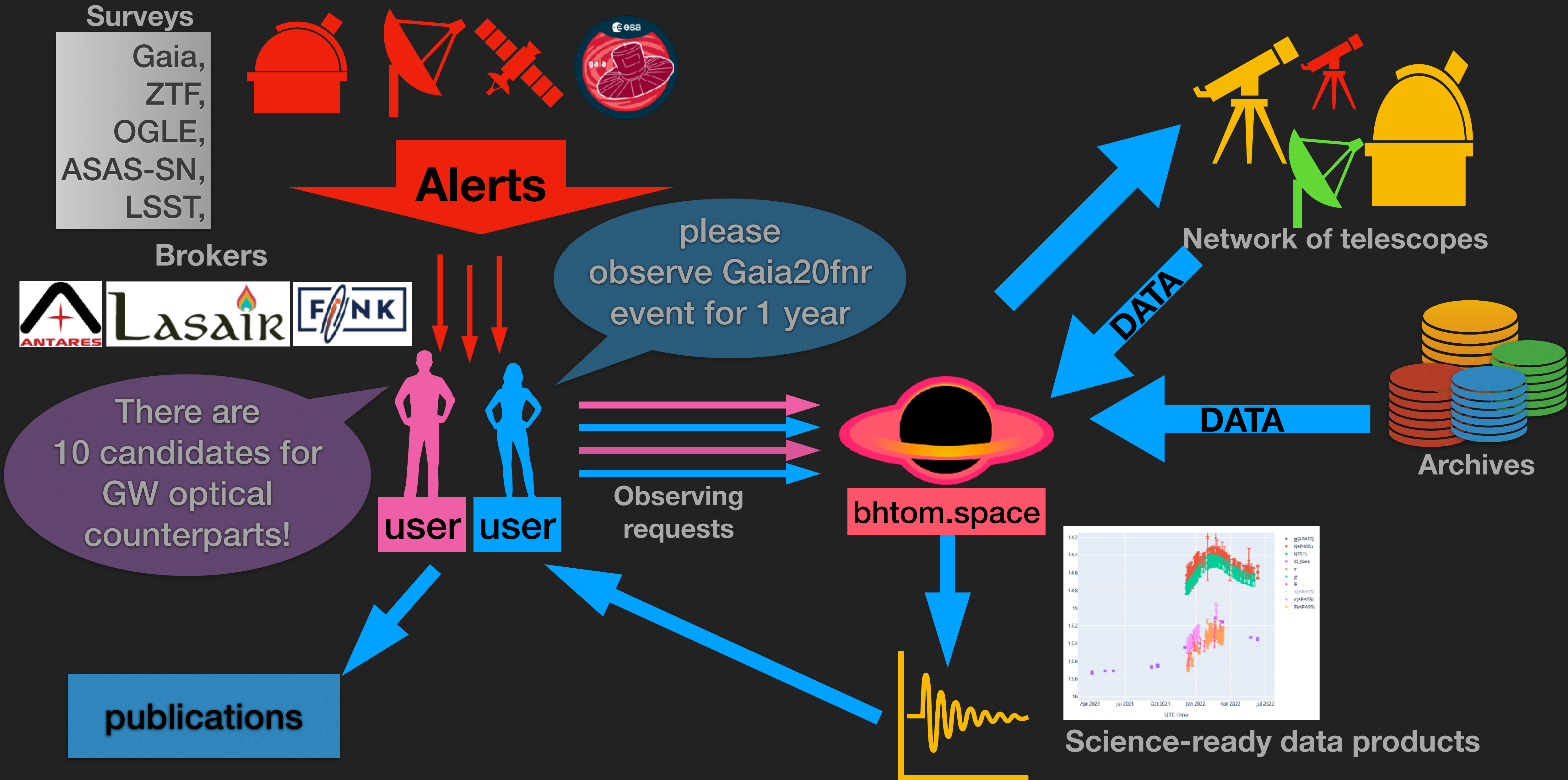


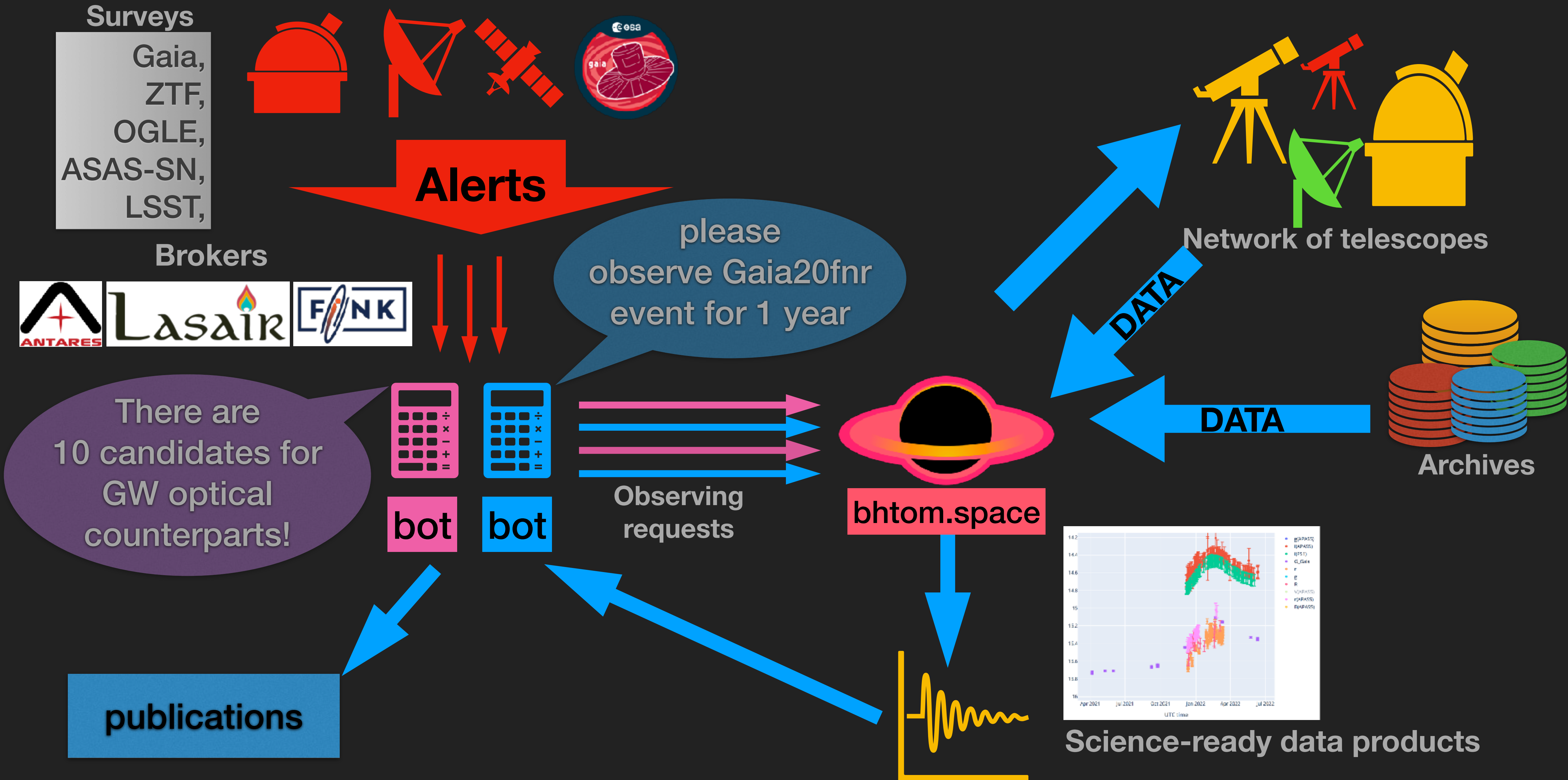
bhtom.space









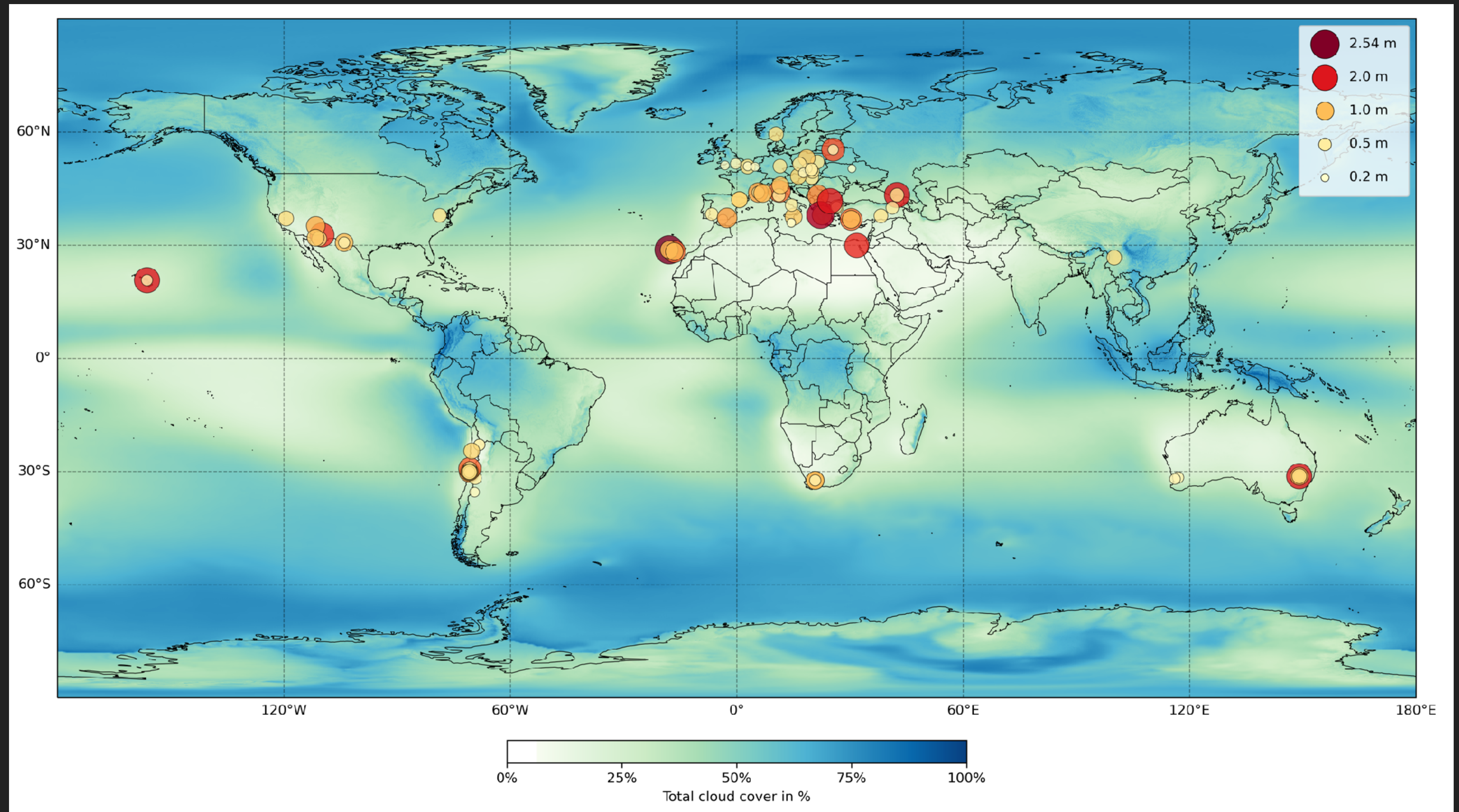


BHTOM TELESCOPE NETWORK

▶ since 2013, built for Gaia Alerts

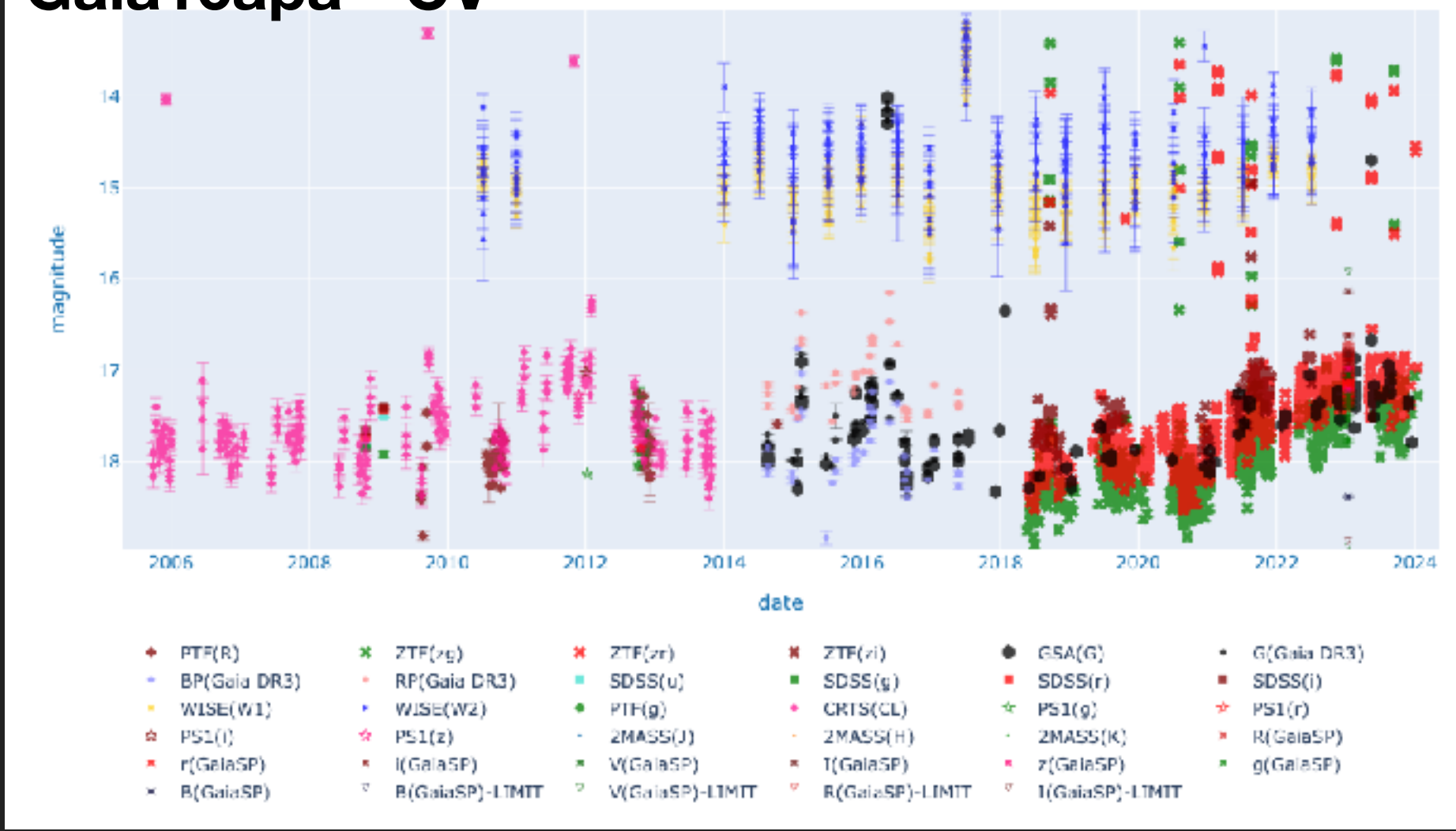


- ~100 telescopes
- sizes 0.25 - 2.5 m
- professional
- amateur
- schools
- outreach facilities
- manual
- robotic
- with good weather
- with poor weather
- volunteering
- via proposals

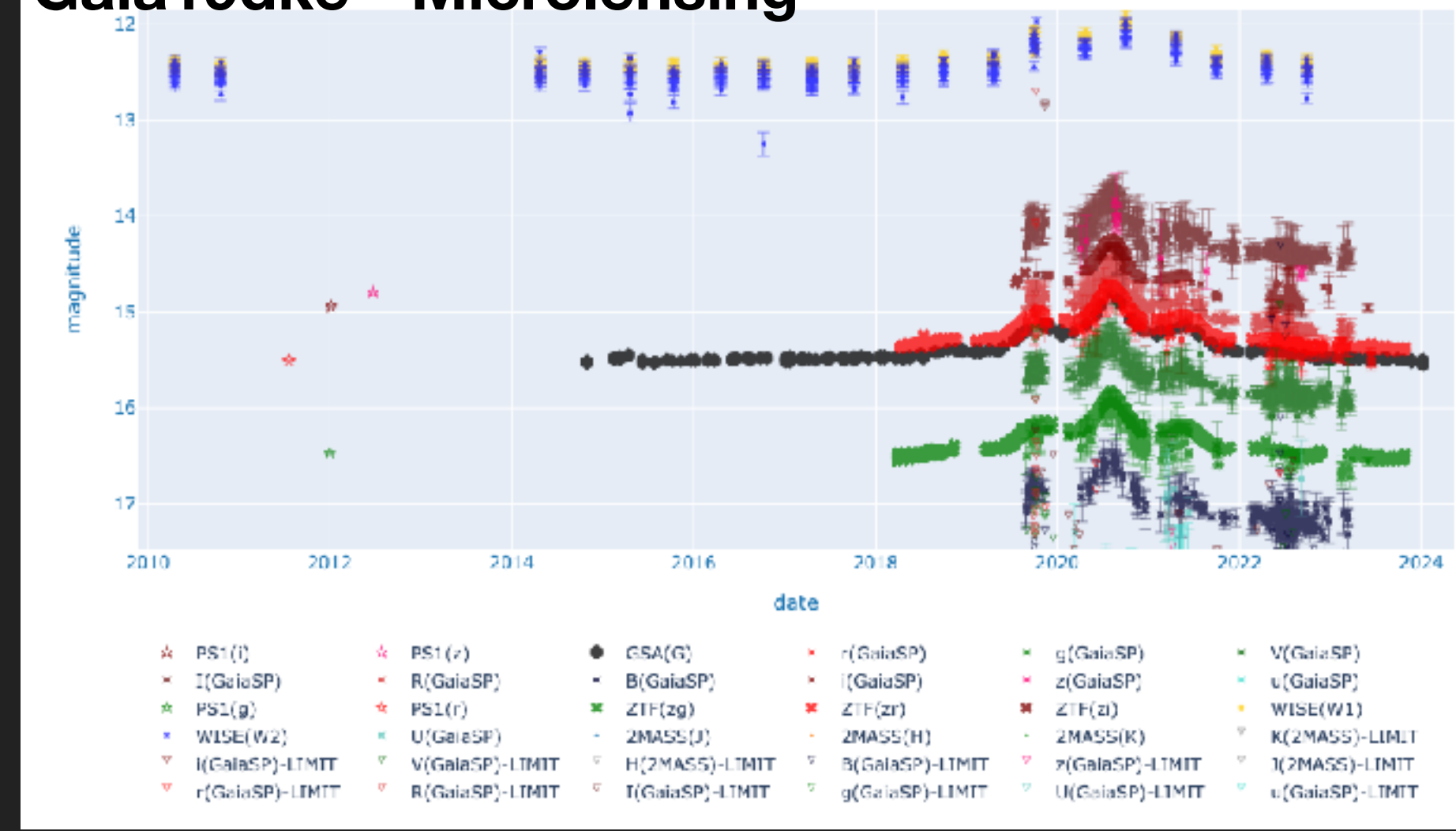


BHTOM - SCIENCE CASES

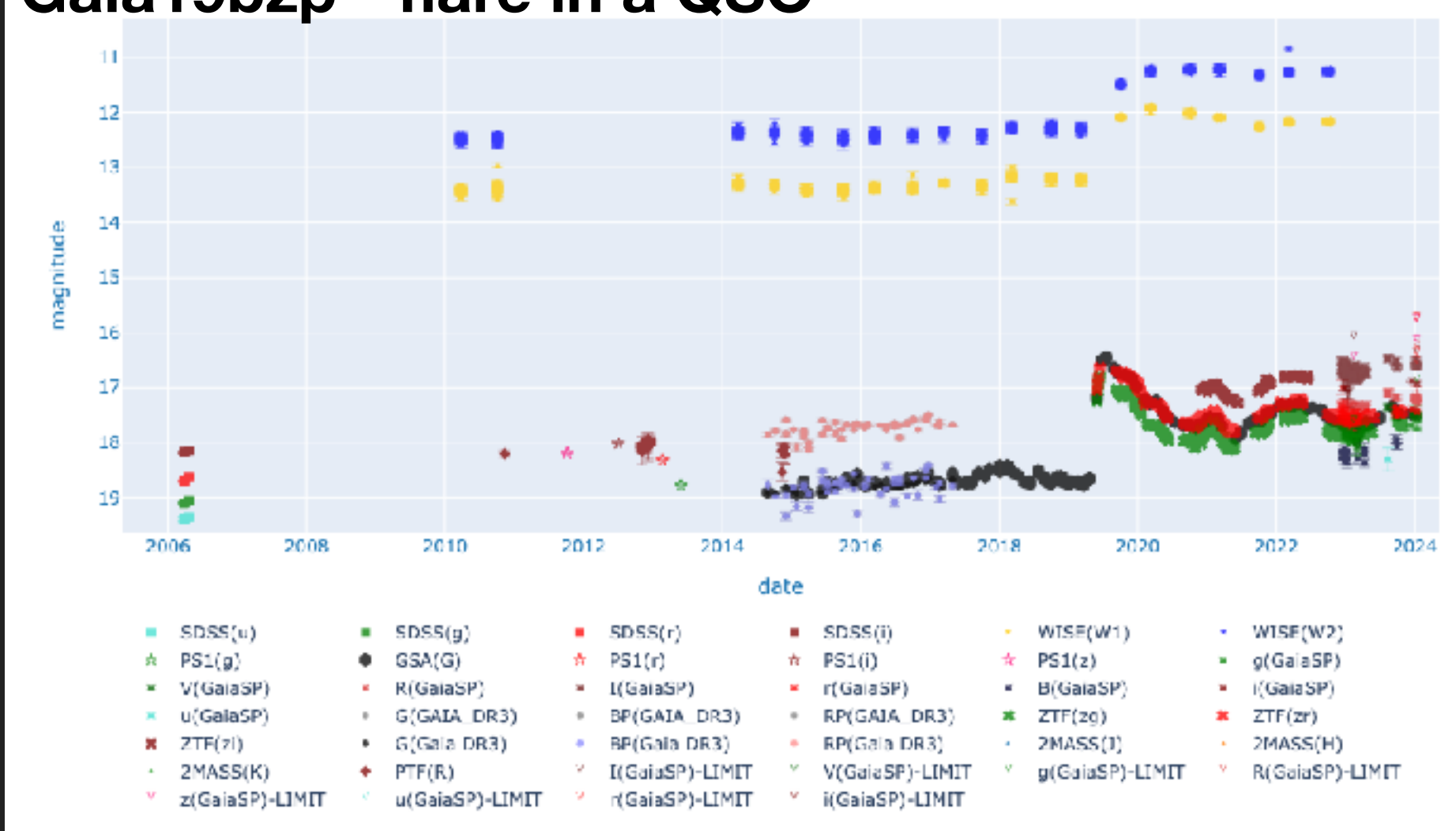
Gaia16apa - CV



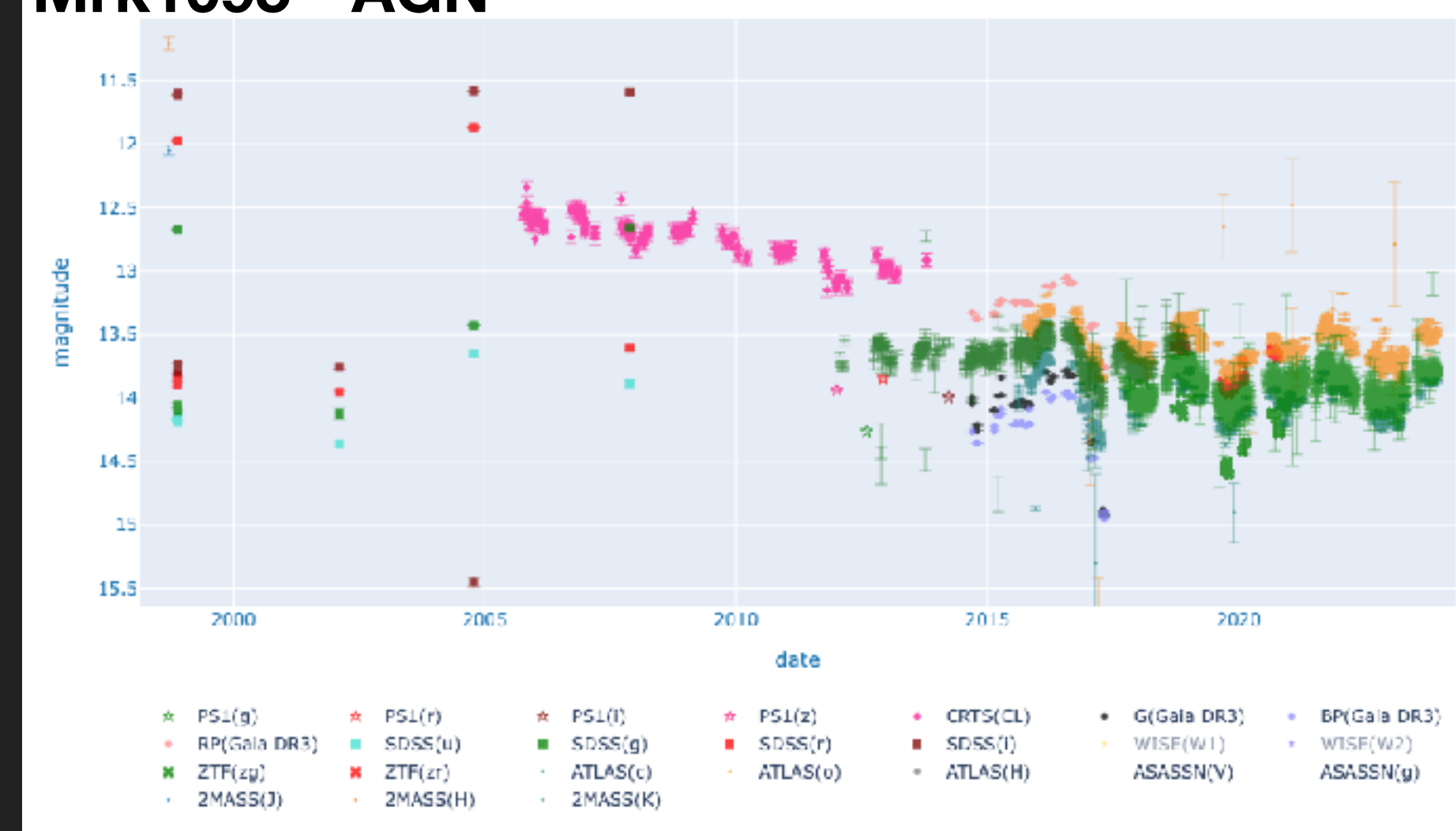
Gaia19dke - Microlensing



Gaia19bzb - flare in a QSO



Mrk1095 - AGN



BHTOM – FROM IMAGE REQUEST TO SCIENCE-READY LIGHT CURVES

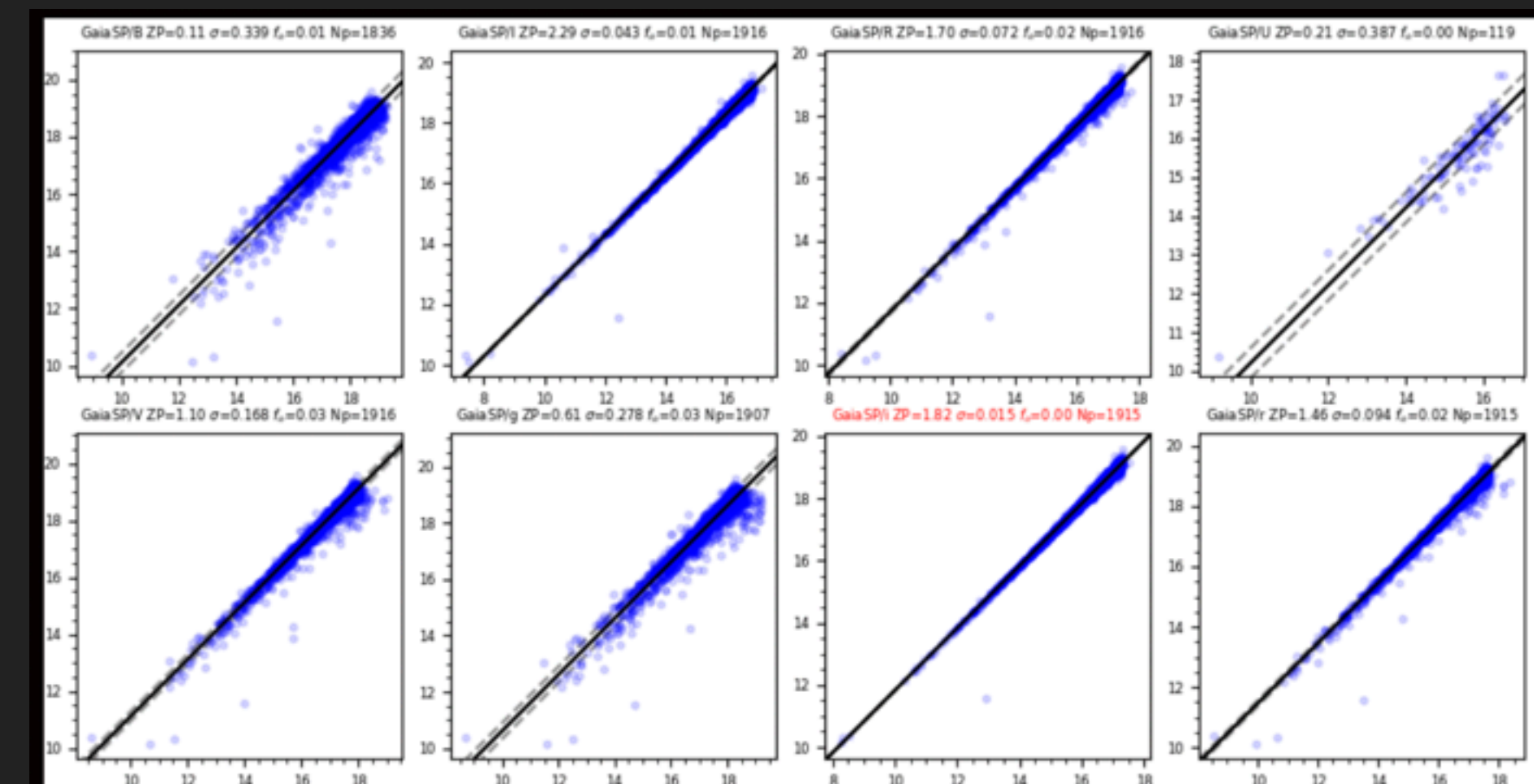
- ▶ fully automated data processing - PSF photometry
- ▶ standardisation of observations from any filter to Gaia Synthetic Photometry
- ▶ downloadable and science-ready - for registered users

ASASSN-24fs, LCO-40cm

SN2024igg, SOAB-40cm

SN2024ggi, GoChile-40cm

Gaia24amo, LCO-1m



Automated detection of filter
and zero-point fit to Gaia Synthetic Photometry

BHTOM – FROM IMAGE REQUEST TO SCIENCE-READY LIGHT CURVES

- ▶ fully automated data processing - PSF photometry
- ▶ standardisation of observations from any filter to Gaia Synthetic Photometry
- ▶ downloadable and science-ready - for registered users

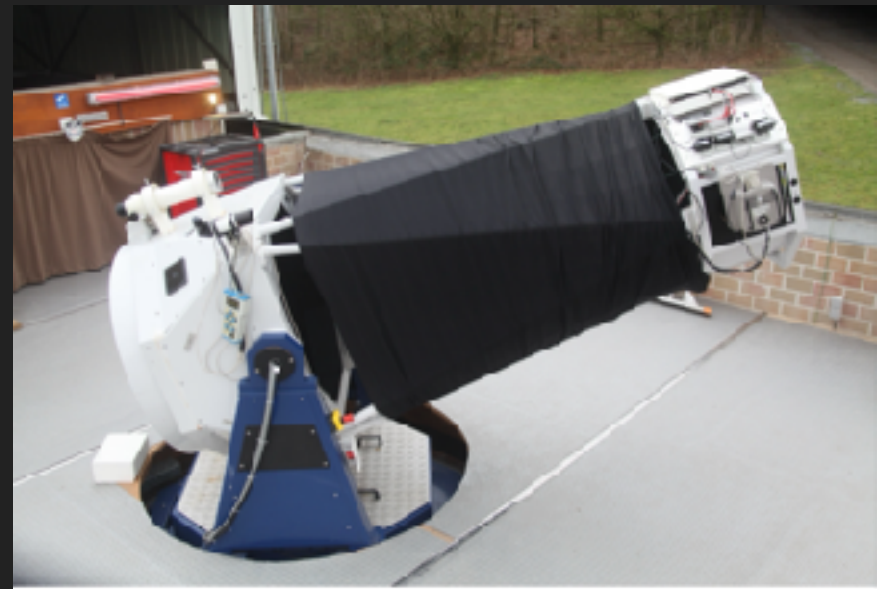
SN2023ixf



Gaia22dkv -planetary microlensing event



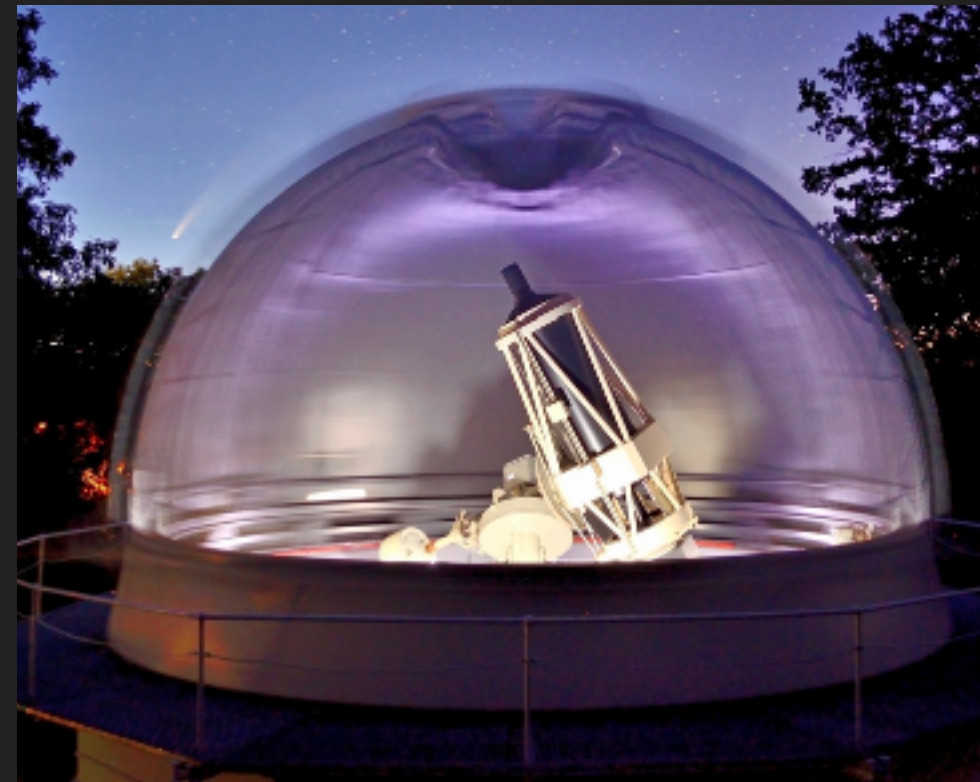
DATA EXAMPLE



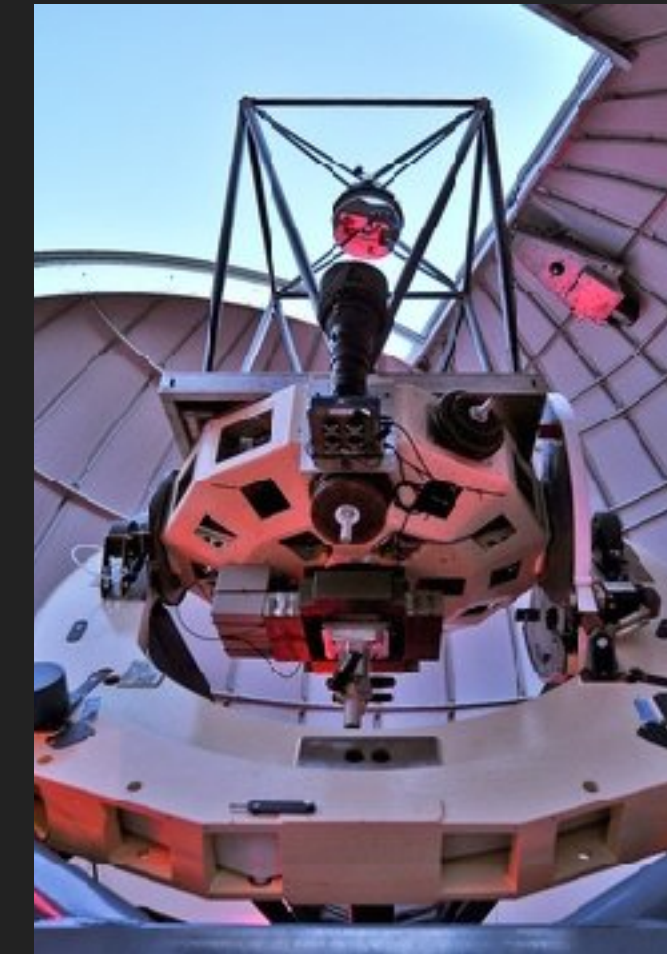
25cm



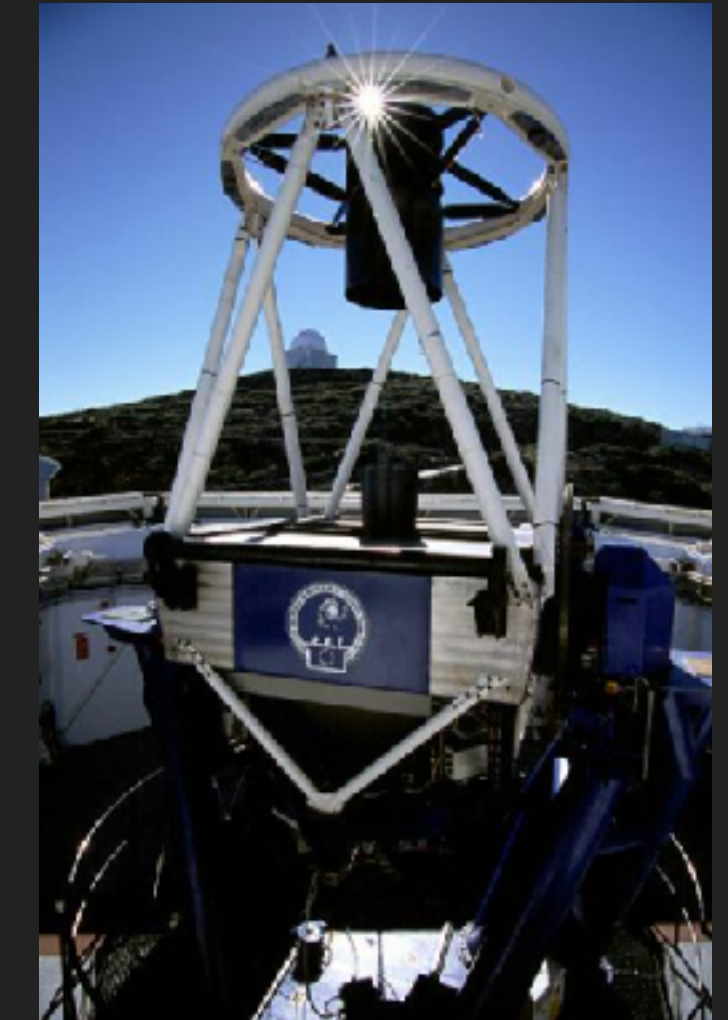
50cm



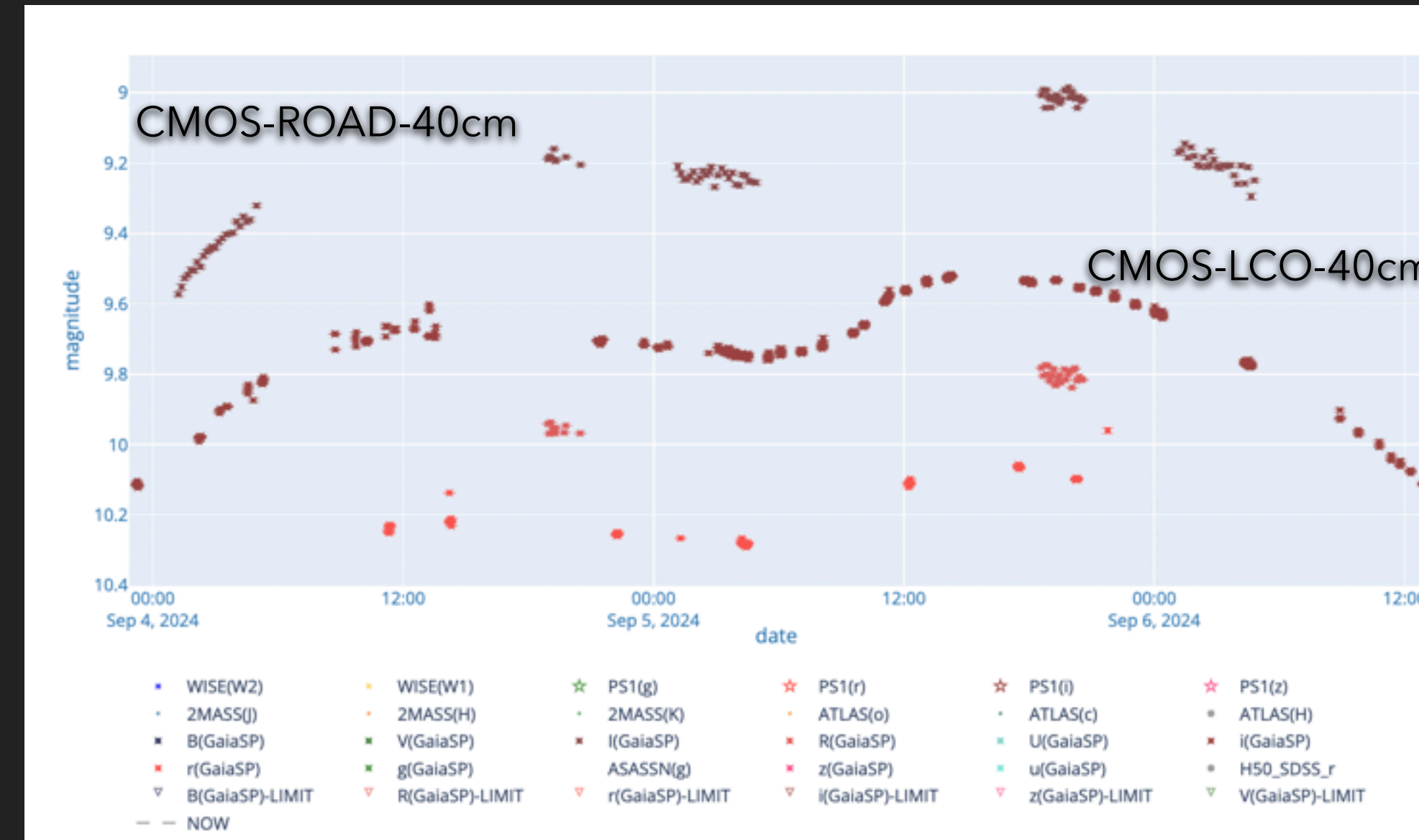
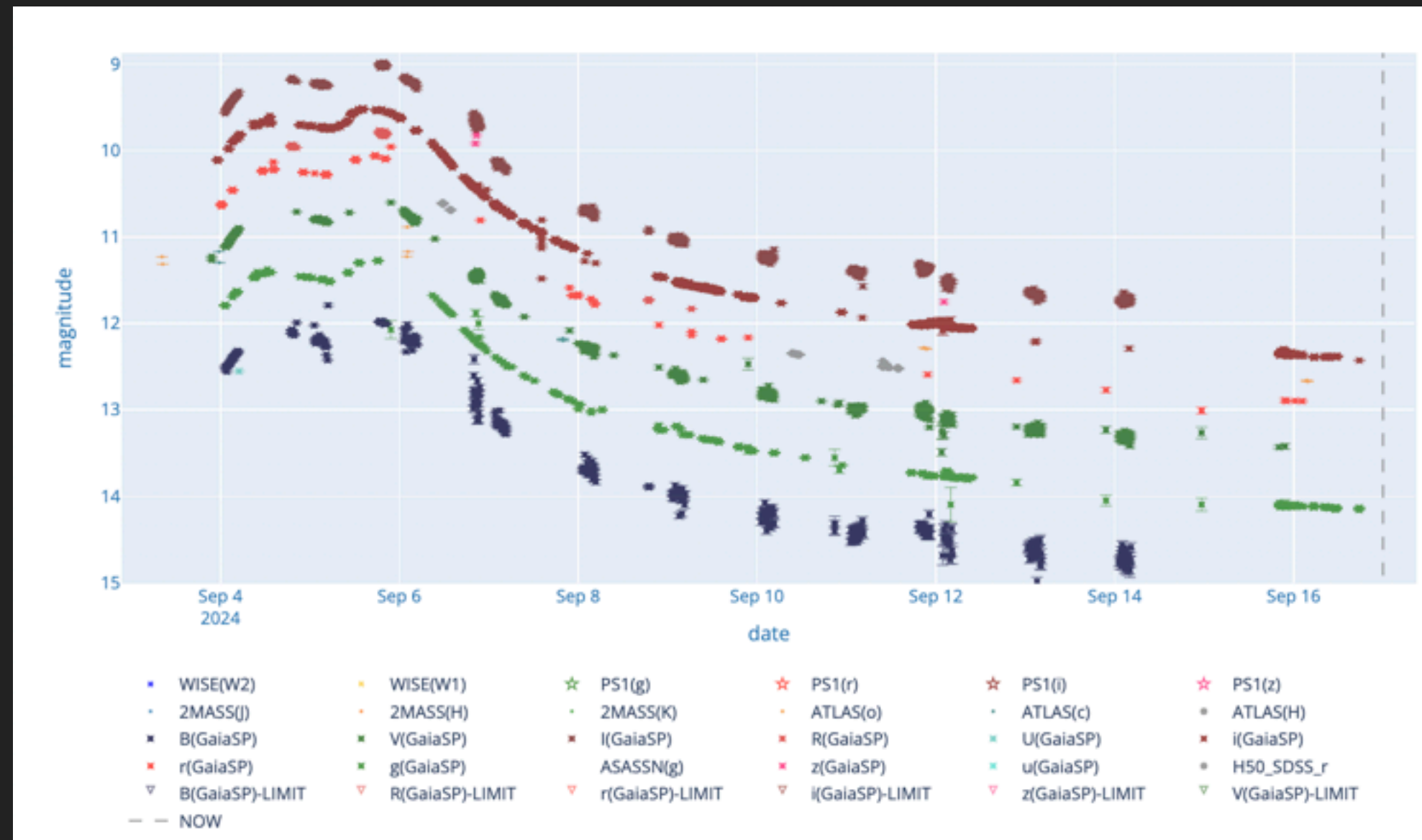
60cm



100cm



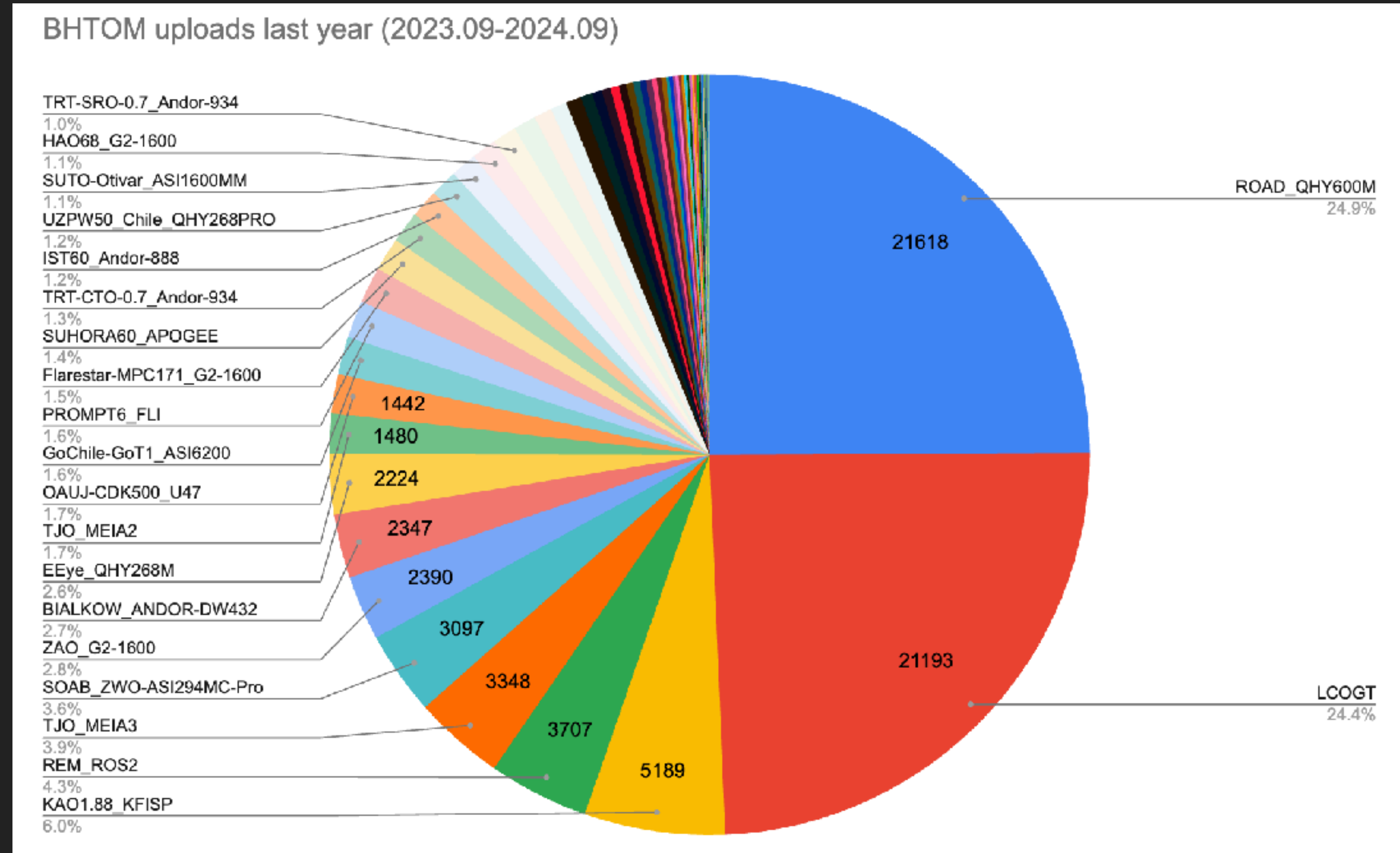
200cm



ASASSN-24fs:
as of 2024-09-17
>2000 frames

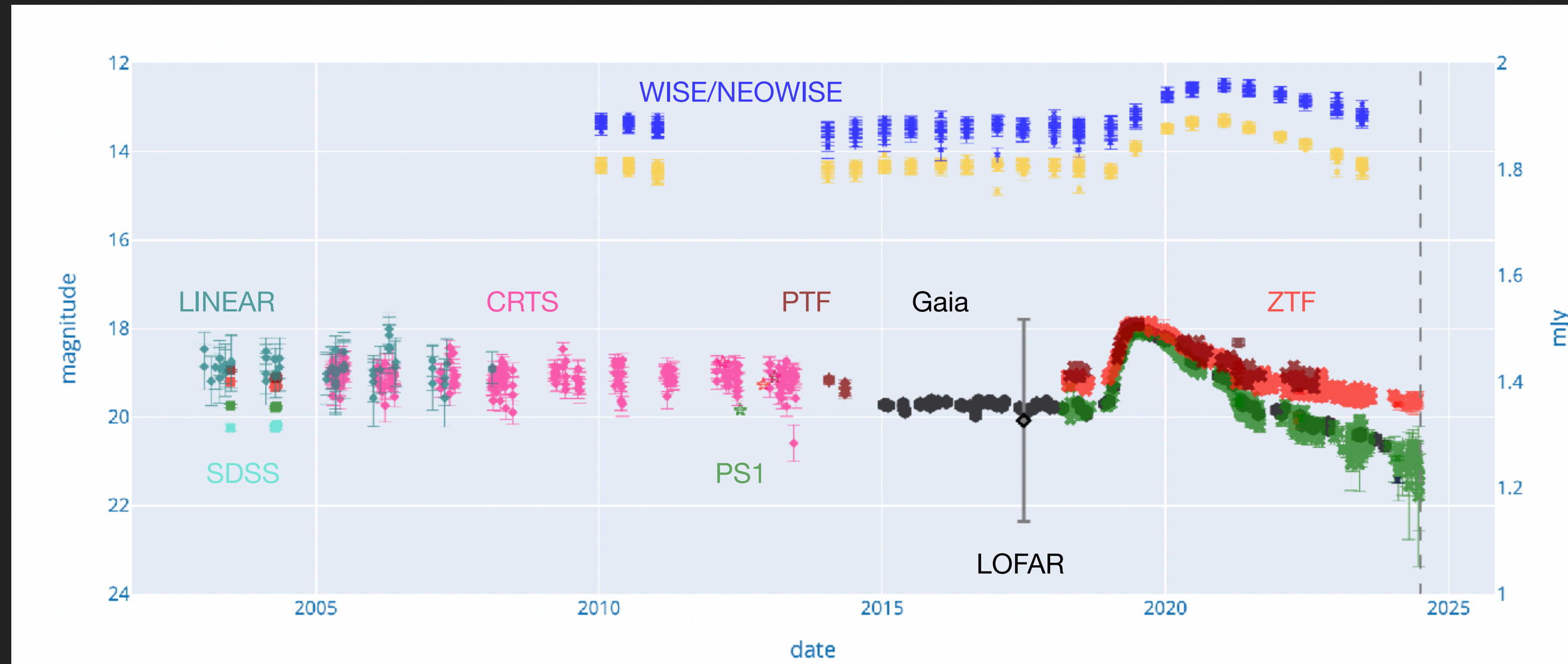
DATA STATS

- ▶ ~85k images in the last year
- ▶ 25% from one single amateur observer!
- ▶ 25% from LCO network (proposal)
- ▶ 50% from 70 heterogeneous set of telescopes
- ▶ up to 5,000 images processed per week
- ▶ (we can handle more)
- ▶ **Is your telescope observing with us?**



BHTOM - TIME-DOMAIN DATA ARCHIVES

- ▶ Automated harvesting archival time-domain data for any target with known coordinates
- ▶ only public data
- ▶ ZTF - *Optical*
- ▶ NEOWISE+ALLWISE - *NIR*
- ▶ 2MASS - *NIR*
- ▶ LOFAR - *Radio*
- ▶ LINEAR, CRTS - *Optical*
- ▶ Gaia DR3 - *Optical*
- ▶ Gaia Alerts - *Optical*
- ▶ SDSS, PS1, DECAPS - *Optical*
- ▶ ATLAS - *Optical*
- ▶ OGLE EWS - *Optical*
- ▶ Long list of TDA archives to add, e.g. DASH - Harvard photographic plates, MACHO



BHTOM - PUBLICATIONS

► All observers included!

Monthly Notices
of the
ROYAL ASTRONOMICAL SOCIETY
MNRAS 515, 1774–1787 (2022)
Advance Access publication 2022 July 12
<https://doi.org/10.1093/mnras/stac1915>

Photometric and spectroscopic study of the burst-like brightening of two *Gaia*-alerted young stellar objects

Zsófia Nagy^{1,2*}, Péter Ábrahám^{1,2,3}, Ágnes Kóspál^{1,2,3,4}, Sunkyung Park^{1,2}, Michał Siwak^{1,2},
Fernando Cruz-Sáenz de Miera^{1,2}, Eleonora Fiorellino^{1,2,5}, David García-Álva,
Marianna Szabó^{1,2,8,9}, Simone Antonucci⁵, Teresa Giannini⁵, Alessio Giunta¹,
Mária Kun^{1,2}, Gábor Marton^{1,2}, Attila Moór^{1,2}, Brunella Nisini⁵, Andras Pál,
Paweł Zieliński¹¹ and Łukasz Wyrzykowski¹²

THE ASTROPHYSICAL JOURNAL, 899:130 (8pp), 2020 August 20
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Gaia 18dvy: A New FUor in the Cygnus OB3 Association

E. Szegedi-Elek¹, P. Ábrahám^{1,2}, Ł. Wyrzykowski³, M. Kun¹, Á. Kóspál^{1,2,4}, L. Chen¹, G. Marton^{1,2}, A. Moór^{1,2},
C. Kiss^{1,2}, A. Pál^{1,2,5}, L. Szabados¹, J. Varga^{1,6}, E. Varga-Verebélyi¹, C. Andreas⁷, E. Bachelet⁸, R. Bischoff⁷,
A. Bódi^{1,9}, E. Breedl¹⁰, U. Burgaz^{11,12}, T. Butterley¹³, J. M. Carrasco¹⁴, V. Čepas¹⁵, G. Damjanovic¹⁶, I. Gezer³,
V. Godunova¹⁷, M. Gromadzki³, A. Gurgul³, L. Hardy¹⁸, F. Hildebrandt⁷, S. Hoffmann⁷, M. Hundertmark¹⁹, N. Ihanec³,
R. Janulis¹⁵, Cs. Kalup¹, Z. Kaczmarek³, R. Könyves-Tóth¹, M. Krezinger¹, K. Kruszyńska³, S. Littlefair¹⁸,
M. Maskoliūnas¹⁵, L. Mészáros¹, P. Mikołajczyk²⁰, M. Mugrauer⁷, H. Netzel²¹, A. Ordasi¹, E. Pakštienė¹⁵, K. A. Rybicki³,
K. Sárneczky¹, B. Seli¹, A. Simon²², K. Šiškauskaitė¹⁵, Á. Sódor¹, K. V. Sokolovsky^{23,24,25},
R. Szakáts¹, L. Tomasella²⁶, Y. Tsapras¹⁹, K. Vida^{1,2}, J. Zdanavičius¹⁵, M. Zieliński³, P. Z

Lens mass estimate in the Galactic disk extreme parallax microlensing event Gaia19dke

M. Maskoliūnas¹, Ł. Wyrzykowski², K. Howl², K. A. Rybicki², P. Zieliński³, Z. Kaczmarek⁴, K. Kruszyńska²,
M. Jabłońska², J. Zdanavičius¹, E. Pakštienė¹, V. Čepas¹, P. J. Mikołajczyk^{2,8}, R. Janulis¹, M. Gromadzki², N.
Ihanec², R. Adomavičienė¹, K. Šiškauskaitė¹, M. Bronikowski^{2,7}, P. Sivak², A. Stankevičiūtė², M. Sitek², M.
Ratajczak², U. Pylypenko², I. Gezer⁵, S. Awiphan⁹, E. Bachelet¹⁰, K. Bakowska³, R. P. Boyle¹², V. Bozza^{3,4}, S. M.
Brincat¹³, U. Burgaz¹¹, T. Butterley²⁹, J. M. Carrasco¹⁴, A. Cassan³⁶, F. Cusano¹⁵, G. Damjanovic⁶, V. S.
Dhillon²², M. Dominik²⁹, F. Dubois¹⁷, H. H. Escnoglou¹⁷, R. Figuera Jaimés³⁴, A. Fukui¹⁹, C. Galdies²⁰, A.
Garofalo¹⁵, V. Godunova²¹, T. Gilver^{17,18}, J. Heidt²², M. Hundertmark³⁶, I. Izviakova³, B. Ioachimczyk³, M. K.
Kamińska³⁹, K. Kamiński³⁹, S. Kaptan^{17,18}, T. Kvernadze²⁴, O. Kvaratskhelia²⁴, S. Littlefair²², O. Michniewicz²⁴,
N. Nakhatutai³⁵, W. Ogłóża⁴², J. M. Olszewska³⁹, M. Polińska³⁹, A. Popowicz²⁵, J. K. T. Qvam²⁶, M.
Radziwonowicz², A. Słowikowska^{37,3}, A. Simon^{30,31}, E. Sonbas^{40,41}, M. Stojanovic⁶, Y. Tsapras³⁶, S.
Vanaverbeke¹⁶, R. W. Wilson²⁹, M. Zejmo²⁴, S. Zola²⁸.

Single lens mass measurement in the high magnification microlensing event Gaia19bld located in the Galactic Disk

K. A. Rybicki,^{1*} Ł. Wyrzykowski,¹ E. Bachelet,² A. Cassan,³ P. Zieliński,¹ A. Gould,^{4,5} S. Calchi Novati,⁶ J.C. Yee,⁷
Y.-H. Ryu,⁸ M. Gromadzki,¹ P. Mikołajczyk,⁹ N. Ihanec,¹ K. Kruszyńska,¹ F.-J. Hamsch,^{10,11} S. Zola,¹² S. J.
Fossey,¹³ S. Awiphan,¹⁴ N. Nakharutai,¹⁵ F. Lewis,^{16,17} F. Olivares E.,¹⁸ S. Hodgkin,¹⁹ A. Delgado,¹⁹ E. Breedl,¹⁹ D.
L. Harrison,^{19,20} M. van Leeuwen,¹⁹ G. Rixon,¹⁹ T. Wevers,¹⁹ A. Yoldas,¹⁹ A. Udalski,¹ M. K. Szymański,¹ I.
Soszyński,¹ P. Pietrukowicz,¹ S. Kozłowski,¹ J. Skowron,¹ R. Poleski,¹ K. Ulaczyk,^{21,1} P. Mróz,^{1,22} P. Iwanek,¹ M.
Wrona,¹ R.A. Street,² Y. Tsapras,²³ M. Hundertmark,²⁴ G. Gandi,⁵ C. Henderson,⁶ Y. Shvartzvald,²⁵ W. Zang

AT2021uey: A planetary microlensing event outside the Galactic bulge

Ban, M.¹, Voloshyn, P.^{2,3}, Adomavičienė, R.⁴, Bachelet, E.^{5,6}, Bozza, V.^{7,8}, Brincat, S. M.⁹, Bruni, I.¹⁰, Burgaz, U.¹¹,
Carrasco, J. M.¹², Cassan, A.⁵, Čepas, V.⁴, Dominik, M.¹³, Dubois, F.¹⁴, Figuera Jaimés, R.¹⁵, Fukui, A.^{16,17},
Galdies, C.^{18,19}, Garofalo, A.¹⁰, Hundertmark, M.²⁰, Kruszyńska, K.¹, Kulijanishvili, V.²¹, Kvernadze, T.²¹,
Logie, L.¹⁴, Maskoliūnas, M.⁴, Mikołajczyk, P. J.^{1,22}, Mróz, P.¹, Narita, N.^{16,17,23}, Pakštienė, E.⁴, Peloton, J.³,
Poleski, R.¹, Qvam, J. K. T.²⁴, Rau, S.¹⁴, Rota, P.^{7,8} Rybicki, K. A.^{1,25}, Street, R. A.²⁶, Tsapras, Y.²⁰,
Vanaverbeke, S.¹⁴, Wambsganss, J.²⁰, Wyrzykowski, Ł.¹, Zdanavičius, J.⁴, and Zieliński, P.²⁷

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. Kolaczekowski^{1,45,79,***}, M. Zieliński¹, P.
Zieliński¹, N. Britavskiy^{4,5}, A. Gomboc³⁵, K. Sokolovsky^{19,31,66}, S.T. Hodgkin⁶, L. Abe⁸⁹, G.F. Aldi^{201,80}, A.
AlMannaer^{62,100}, G. Altavilla^{72,7}, A. Al Qasim^{62,100}, G.C. Anupama⁸, S. Awiphan⁹, E. Bachelet⁶³, V. Bakis¹⁰, S.
Baker¹⁰⁰, S. Bartlett⁸⁰, P. Bendjoya¹¹, K. Benson¹⁰⁰, I.F. Bikmaciev^{76,82}, G. Birenbaum¹¹², N. Blagorodnova¹²⁴, S.
Blanco-Cuaresma^{151,74}, S. Boeva¹⁶, A.Z. Bonanos¹⁹, V. Bozza^{501,80}, D.M. Bramich⁶², I. Bruni²⁵, R.A. Burenin^{84,85}, U.
Burgaz²¹, T. Butterley¹²², H. E. Caines³⁴, D. B. Caton²¹, S. Calchi Novati⁸³, J.M. Carrasco²³, A. Cassan²⁹, V. Čepas⁵⁶,
M. Cropper¹⁰⁰, M. Chruslińska^{1,24}, G. Clementini²⁵, A. Clerici³⁵, D. Conti⁴⁰, M. Conti⁴⁸, S. Cross⁶³, F. Cusano²⁵, G.
Damjanovic²⁶, A. Dapergolas¹⁹, G. D'Agostini⁸¹, J. H. J. de Bruijne²⁷, M. Dennefeld⁶⁹, V. S. Dhillon^{30,4}, M. Dominik³¹,
J. Dziedzic¹, O. Eredd³², M. V. Eiselevich⁸⁶, H. Esenoglu³³, L. Eyerdal²⁴, R. Figuera Jaimés^{31,53}, S. J. Fossey¹⁴, A. I.
Galceev^{76,87}, S. A. Grebnev⁸⁴, A. C. Gupta⁹⁹, A. G. Gutaev⁷⁶, N. Hallakour¹², A. Hamanowicz^{113,6}, C. Han², B.

SN 2018zd: An Unusual Stellar Explosion as Part of the Diverse Type II Supernova Landscape

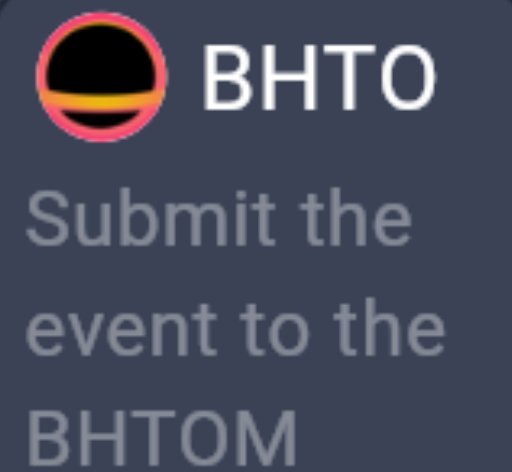
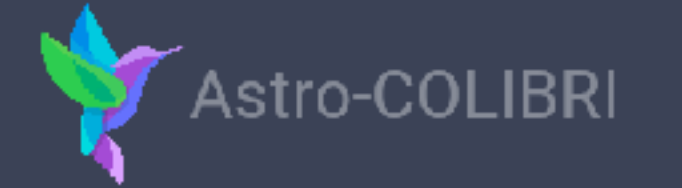
Jujia Zhang,^{1,2,3,4*} Xiaofeng Wang,^{5,6} József Vinkó^{7,8,9} Qian Zhai,^{1,2,3,4} Tianmeng Zhang,¹⁰
Alexei V. Filippenko,^{12,13} Thomas G. Brink,¹² WeiKang Zheng,¹² Łukasz Wyrzykowski,¹⁴
Przemysław Mikołajczyk,¹⁴ Fang Huang,¹⁵
Xinhan Zhang,⁵ Huijuan Wang,^{10,11} James
A. Bódi,^{7,18} G. Csörnyei,^{7,8} O. Hanyecz,⁷ I
R. Könyves-Tóth,^{7,8} A. Ordasi,⁷ A. Pál,^{7,8}
G. Zsidi^{7,8,19}

The *Gaia* alerted fading of the FUor-type star Gaia21elv

Zsófia Nagy,^{1,2*} Sunkyung Park,^{1,2} Péter Ábrahám,^{1,2,3} Ágnes Kóspál,^{1,2,3,4} Fernando Cruz-Sáenz de Miera,^{1,2}
Mária Kun,^{1,2} Michał Siwak,^{1,2} Zsófia Marianna Szabó,^{1,2,5,6} Máté Szilágyi,^{1,2,3} Eleonora Fiorellino,⁷
Teresa Giannini,⁸ Jae-Joon Lee,⁹ Jeong-Eun Lee,¹⁰ Gábor Marton,^{1,2} László Szabados,^{1,2} Fabrizio Vitali,⁸
Jan Andrzejewski,¹¹ Mariusz Gromadzki,¹² Simon Hodgkin,¹³ Maja Jabłońska,¹² Rene A. Mendez,¹⁴
Jaroslav Merc,¹⁵ Olga Michniewicz,¹¹ Przemysław J. Mikołajczyk,^{12,16} Uliana Pylypenko,¹²
Milena Ratajczak,¹² Łukasz Wyrzykowski,¹² Michał Zejmo,¹¹ Paweł Zieliński¹⁷

BHTOM – PROGRAMABLE ACCES (API)

- ▶ All functionalities of BHTOM are accessible via API
- ▶ Scripting the data flow to/from telescopes, observing requests, images upload for processing
- ▶ Astro-COLIBRI connected already!
- ▶ We provide ready scripts for: data download, data upload, target selection



BHTOM2 API Documentation

DATA DOWNLOAD API

Here we present end-points how to download the photometry and radio data from BHTOM.

Please contact us if you plan to use the data in a publication. By downloading the data from BHTOM you agree to follow our data policy and to use this acknowledgment:

The data was obtained via [BHTOM] (<https://bhtom.space>), which has received funding from the European Union's Horizon 

For more information about acknowledgement and data policy please visit <https://about.bhtom.space>

1. Photometry download

With this API one can download all photometric observations (magnitudes) in semi-color separated form. The columns of the output are the following:

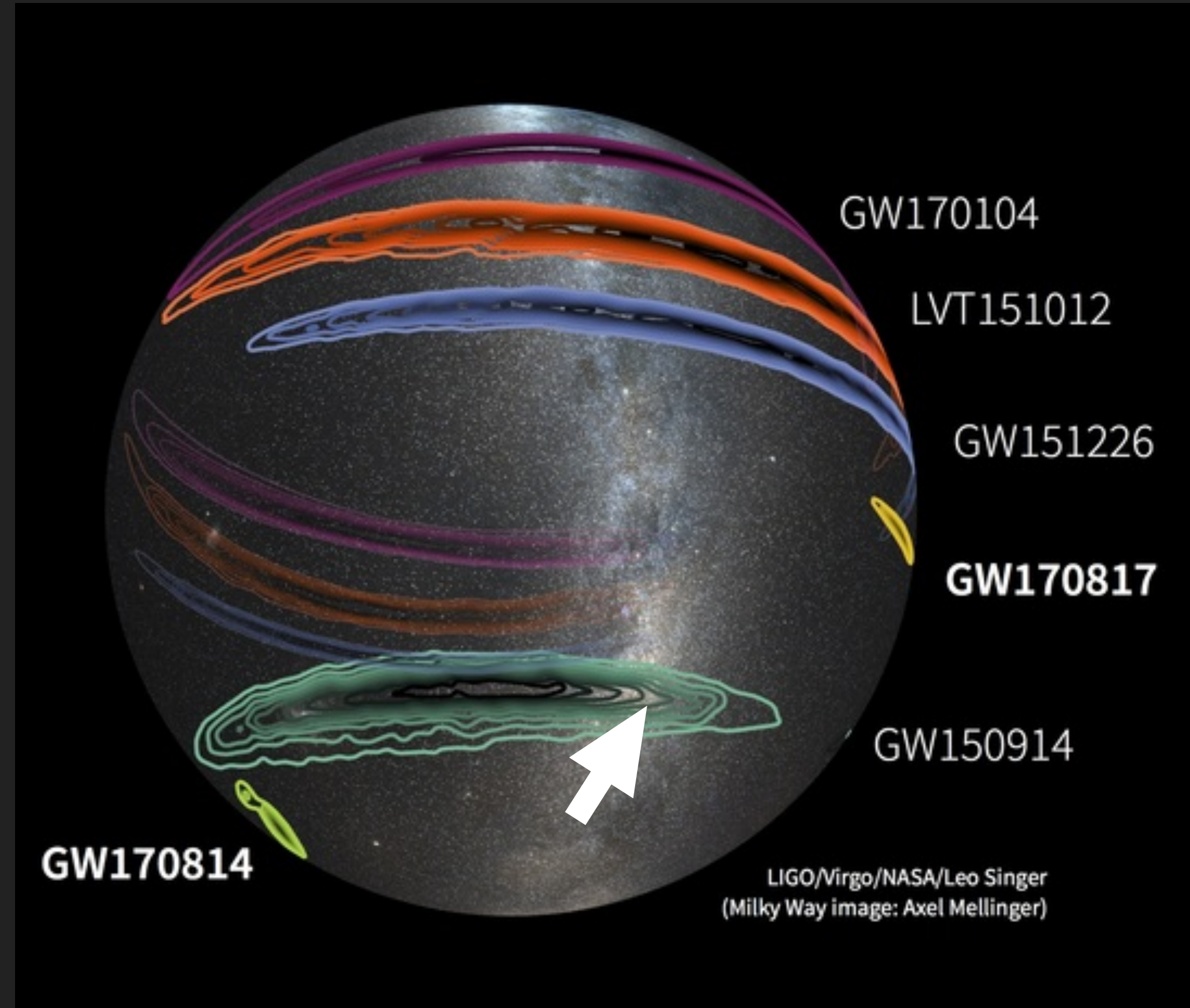
MJD;Magnitude;Error;Facility;Filter;Observer

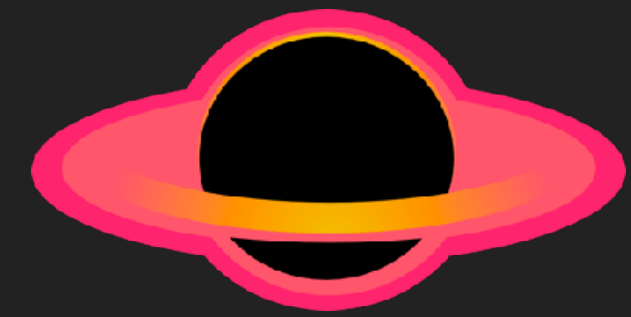
Request

- Method: POST
- URL: `/targets/download-photometry/`

BHTOM FOR GW

- ▶ Distributed telescope network
→ can respond to multiple candidates for GW counterparts on both hemispheres
- ▶ Archives
→ can rule out a candidates just based on the historic time-domain data
- ▶ Automated data processing
→ automated confirmation or rejection of candidates
- ▶ Galactic Plane! → we are not afraid!





BHTOM Targets for 16 September, 2024 0 views



Lukasz Wyrzykowski <wyrzykow@gmail.com>

13:02 (5 hours ago) ☆ << ⋮

to bhtomtargets@googlegroups.com

Hello,

Greetings from the BHTOM Automated Newsletter!

As of 2024-09-16 10:01:58.253129+00:00, these are the new targets added in the last week, sorted by magnitude:

	name	ra	dec	mag_last	sun_separation	classification	description
	V1725 Sco	256.693920	-35.468560	10.6	86.0	Nova	Astro-COLIBRI target
	Mrk 42	178.424000	46.211833	15.6	44.0	AGN	None
	WISEA J091848.61+211717.0	139.702580	21.288110	16.8	38.0	AGN	X-ray variable AGN
	2MASX J00414632-0807100	10.443019	-28.461840	17.0	150.0	Unknown	X-ray supersoft source

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

	observatory-user	count	ra	dec	mag	sun_separation	classification	description
		756	17.0			27.0	QSO	variable quasar probably binary SMBH, not for observations
	Franz-Josef Hamsch (ROAD_QHY600M)	1781	9460	17.5		61.0	Unknown	Gaia and GALEX source brightens by ~1 mag
	Rachel Street (LCOGT-Teide-40cm_QHY600M)	412	0889	17.6		58.0	Unknown	X-ray supersoft source
	Waldemar Ogloza (Planetarium_Slaskie_Kepler4040)	294	6390	17.9		68.0	Unknown	long-term rise in Gaia and SDSS source
	Rachel Street (LCOGT-HO-40cm_QHY600M)	276	4883	18.8		114.0	Microlensing Event	Candidate microlensing event from Chinese KATS survey, KATS24Q003.
	Sjoerd Dufoer (EEye_QHY268M)	210						

BHTOM – TARGET SUGGESTIONS DEDICATED FOR A OBSERVATORY



Hello UZPW50_Chile_QHY268PRO,

Greetings from the BHTOM Automated Target Selector!

Date: 02 July, 2024

Targets for you (importance \geq 1, mag_limit 19.0, visible now, airmass $>$ 3, the ones you observed have +100 points)

name	ra_hex	dec_hex	min_airmass	mag_last	classification	description	score
PMNJ0730-6602	7:30:49.56	-66:02:18.88	2.080982	16.5	AGN	IAUZ Target	110.00
SN2024gy	12:15:51.29	+13:06:56.12	1.441714	17.4	SN	classified SN Ia at 5Mpc	109.99
HE0435_4312	4:37:11.79	-43:06:04.28	1.605307	16.9	QSO	Long term variable quasar for monitoring	109.00
HE0413_4031	4:15:14.46	-40:23:41.11	1.488472	15.9	QSO	Long term variable quasar for monitoring	109.00
CTS_C30.10	4:47:19.99	-45:37:38.35	1.657705	16.9	QSO	Long term variable quasar for monitoring	109.00
PKS0454-234	4:57:03.18	-23:24:52.02	2.062416	15.5	QSO	long time monitoring for ROTUZ team	108.00

Hello REM_ROS2,

Greetings from the BHTOM Automated Target Selector!

Date: 01 July, 2024

Targets for you (importance \geq 1, mag_limit 16.0, visible now, airmass $>$ 2.5, the ones you observed have +100 points)

name	ra_hex	dec_hex	min_airmass	mag_last	classification	description	score
Gaia23cpd	19:10:08.82	-4:43:14.74	1.101341	15.0	Unknown	potential long and bright microlensing event or Be star outburst	30.00
Gaia24amk	16:18:25.38	-54:04:43.82	1.102430	15.7	Unknown	candidate microlensing event	30.00
Gaia23cyl	17:45:52.25	-42:45:36.22	1.030914	14.7	Microlensing Event	microlensing event in the bulge	29.00

WORKSHOPS SINCE 2010



GAIA SCIENCE ALERTS WORKSHOP
 23-25 June 2010
 Institute of Astronomy, Cambridge



Gaia Science Alerts Verification and Follow-up Workshop
 29 June - 1 July 2011
 Institute of Astronomy, University of Cambridge



GAIA SCIENCE ALERTS WORKSHOP
 BOLOGNA 6-7 SEPTEMBER 2012



Gaia Science Alerts



FIFTH GAIA SCIENCE ALERTS WORKSHOP
 UNIVERSITY OF WARSAW 9-12 SEPTEMBER 2014



Gaia Science Alerts Workshop 2015
 Liverpool John Moores University (UK)
 10-13 November 2015

- Follow-up observations
- Automated classification
- Gaia Alerts Publisher
- Robotic telescopes
- Outreach
- Transient surveys
- Hands-on sessions



7th Gaia Science Alerts Workshop
 7-9 December 2016 * SRON Utrecht NL



8th OPTICON Gaia Science Alerts Workshop
 6-8 December 2017
 Warsaw, Poland



The 9th OPTICON GAIA SCIENCE ALERTS WORKSHOP
 8-10 OCTOBER 2018
 Vipava, Slovenia

- Overview of the Gaia mission
- Overview of the Gaia Science Alerts
- Gaia Alerts Highlights
- Gaia Alerts and DR2
- Machine-learning classification of transients
- New photometric calibration server
- Organizing the follow-up



10th OPTICON Gaia Science Alerts Workshop
 Astronomical Observatory, University of Coimbra, 16-20 December 2019

- update on the Gaia mission
- update on the improvements in the Gaia Alerts
- Gaia Alerts highlights and results
- synergies with radio, X-ray and high energy
- new members of the telescope network
- new photometric calibration server
- organization of the follow-up
- future plans



11th OPTICON Gaia Science Alerts Workshop
 from the comfort of our homes
 18-22 January 2021

- update on Gaia mission
- Gaia Alerts highlights and results
- future of alerts and extension of Gaia
- improvements in Gaia Alerts
- new photometric calibration server
- synergies with radio, X-ray and high energy observations
- the mission of the telescope network
- organization of the follow-up



12TH GAIA SCIENCE ALERTS WORKSHOP
 2021 NOV 8-12

FIRST ORP-TIME DOMAIN MEETING



13th ORP and Gaia Science Alerts Workshop
 4-7 October 2022
 Pula, Sardinia



14th Gaia Science Alerts and ORP Time-Domain Workshop
 Valletta, Malta
 2-5 October 2023

ARCHIVAL RECORDINGS: [HTTP://WWW.AST.CAM.AC.UK/IOA/WIKIS/GSAWG/WIKI](http://www.ast.cam.ac.uk/IOA/WIKIS/GSAWG/WIKI)

WORKSHOPS SINCE 2010

15TH GAIA SCIENCE ALERTS AND ORP TIME-DOMAIN WORKSHOP

Heraklion, Crete
30 Sep-2 Oct 2024



CELEBRATE 10TH ANNIVERSARY OF THE FIRST GAIA ALERTS

Gaia mission and Alerts BHTOM follow-up system highlights and results synergies with radio telescope network opportunities

Workshop Organising Committee:
Łukasz Wyrzykowski (Warsaw)
Simon Hodgkin (Cambridge)
Vassilis Charmandaris (FORTH)
Przemysław J. Mikolajczyk (Warsaw/Wrocław)
Justyna Olszewska (Poznań)

<https://bit.ly/gaialerts2024>



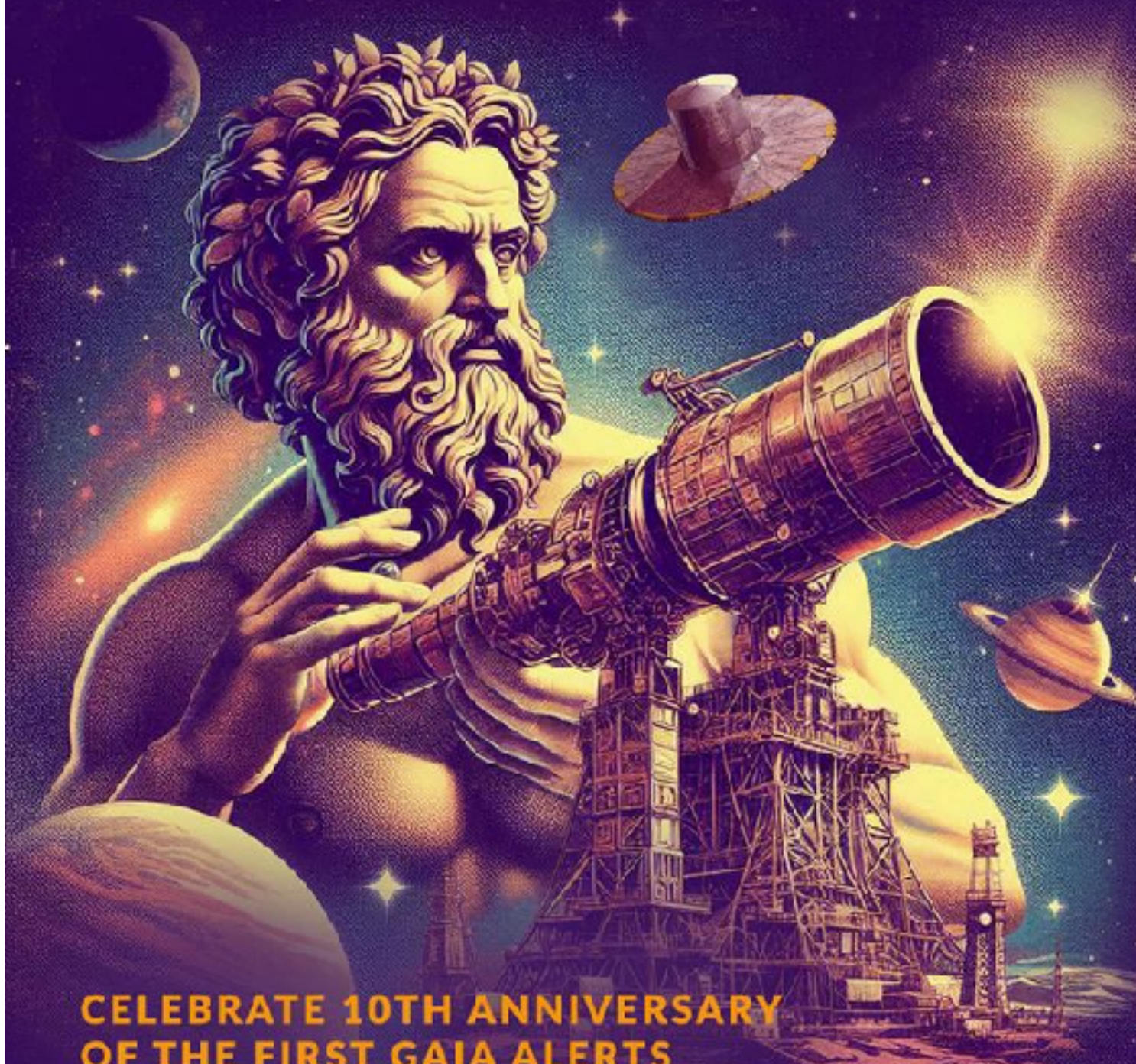
ARCHIVAL RECORDINGS: [HTTP://WWW.AST.CAM.AC.UK/IOA/WIKIS/GSAWG/WIKI](http://www.ast.cam.ac.uk/IOA/WIKIS/GSAWG/WIKI)

Łukasz Wyrzykowski

WORKSHOPS SINCE 2010

15TH GAIA SCIENCE ALERTS AND ORP TIM Σ -DOMAIN WORKSHOP

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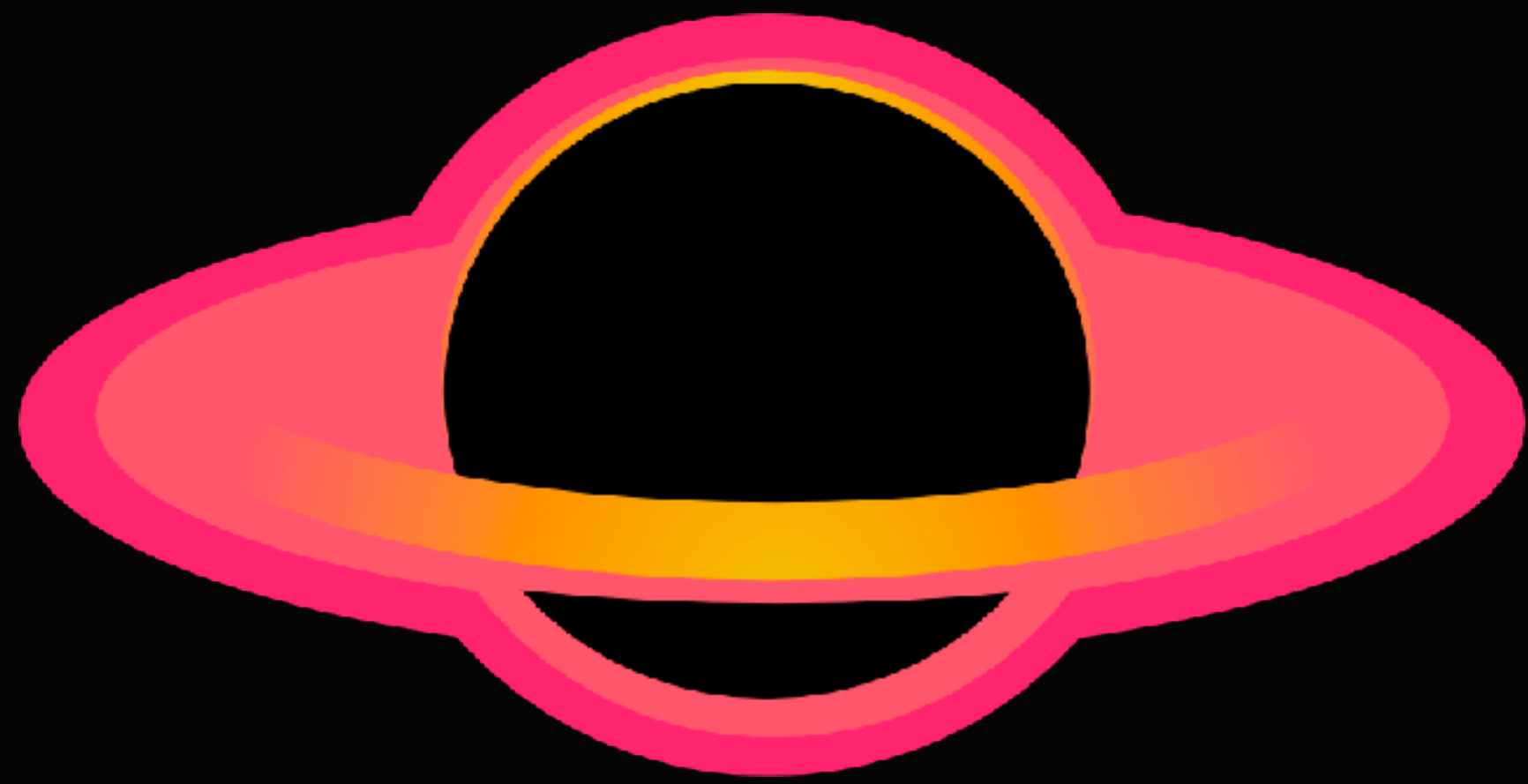


ACME Hackaton on Time-Domain Astronomy Alerts and Archives IAC Tenerife September 2025 (prelim)



ARCHIVAL RECORDINGS: [HTTP://WWW.AST.CAM.AC.UK/IOA/WIKIS/GSAWGWIKI](http://www.ast.cam.ac.uk/IOA/WIKIS/GSAWGWIKI)

Łukasz Wyrzykowski



enjoy bhtom !



BHTOM.SPACE



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[LW@
ASTROUW.EDU.PL](mailto:LW@ASTROUW.EDU.PL)