

BHTOM

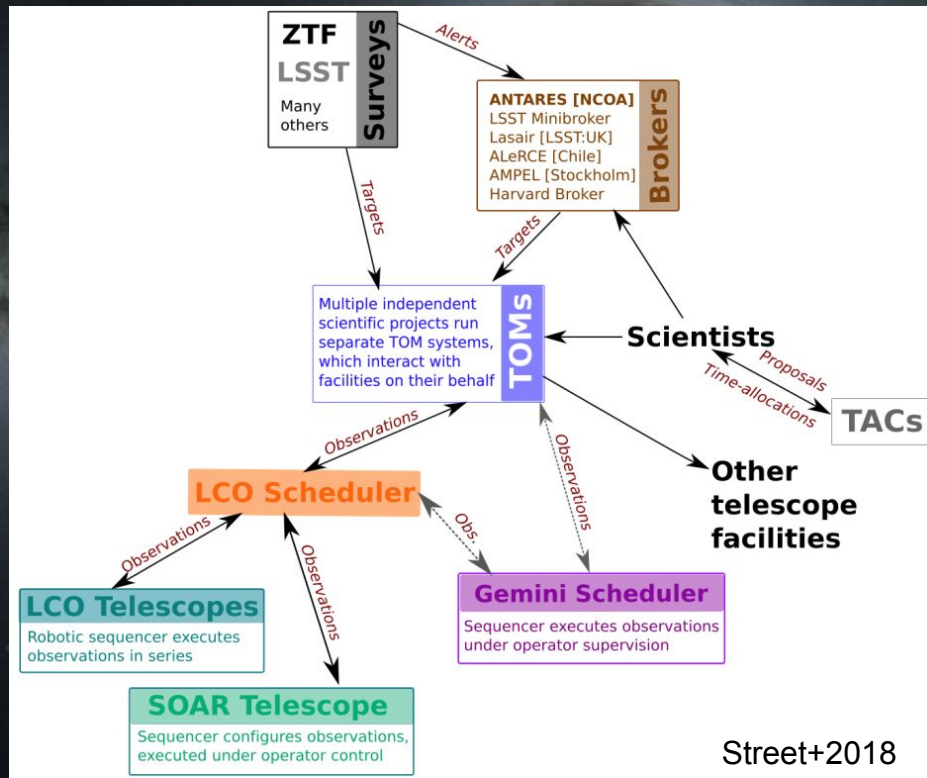
More than a Target Observation Manager

Presenter: Priscila J. Pessi
PI: Łukasz Wyrzykowski

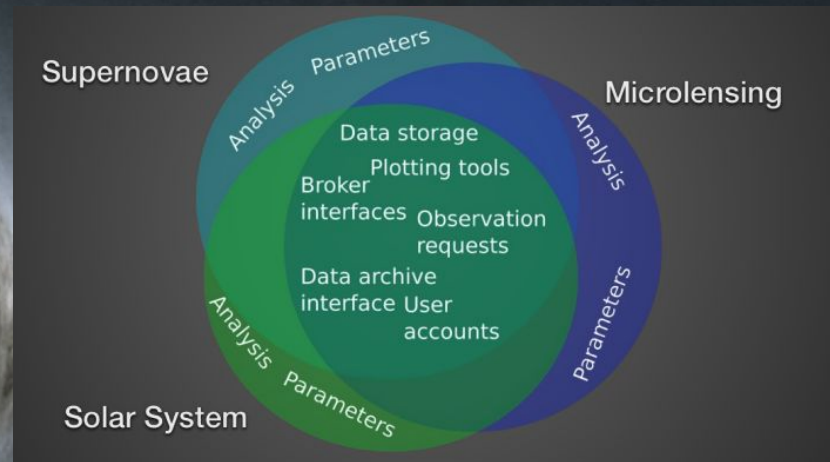
bhtom.space



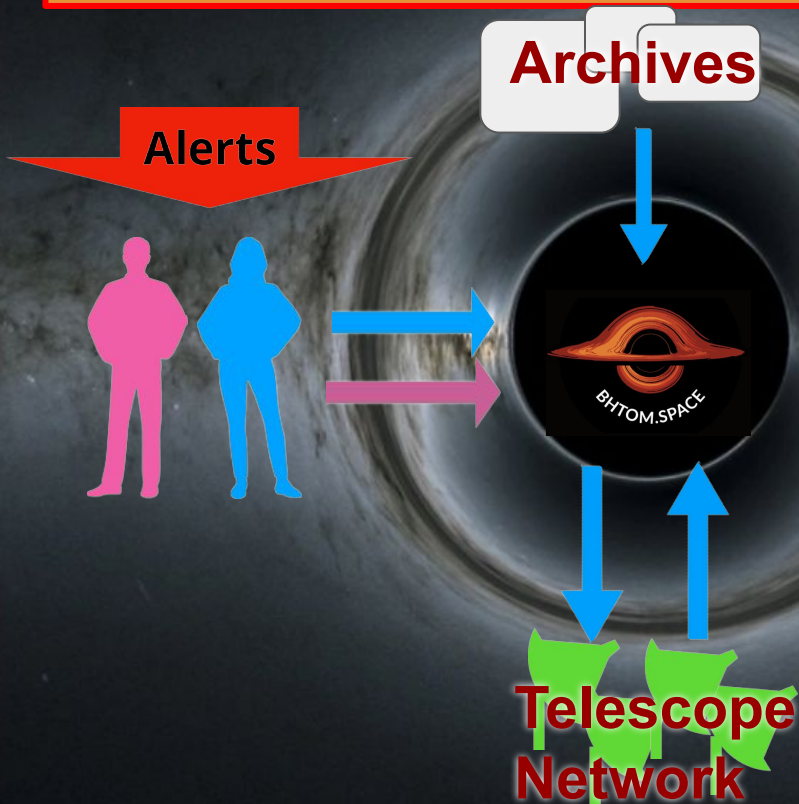
Target and Observation Manager:



Street+2018



BHTOM: functionalities



Web tool for coordination for time-domain observations.

Automated observation requests.

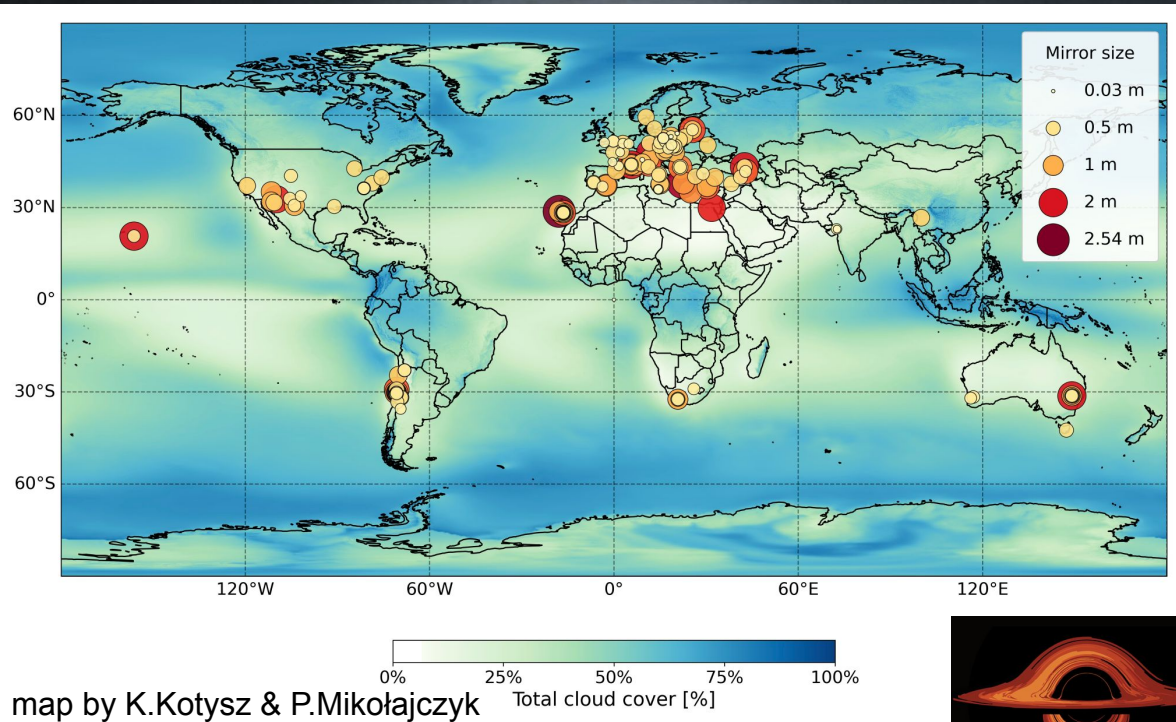
Processing of raw images from heterogenous units.

Automated standardisation.

Archival multi-wavelength time-domain photometry.

Open for new users, new telescopes, new targets!

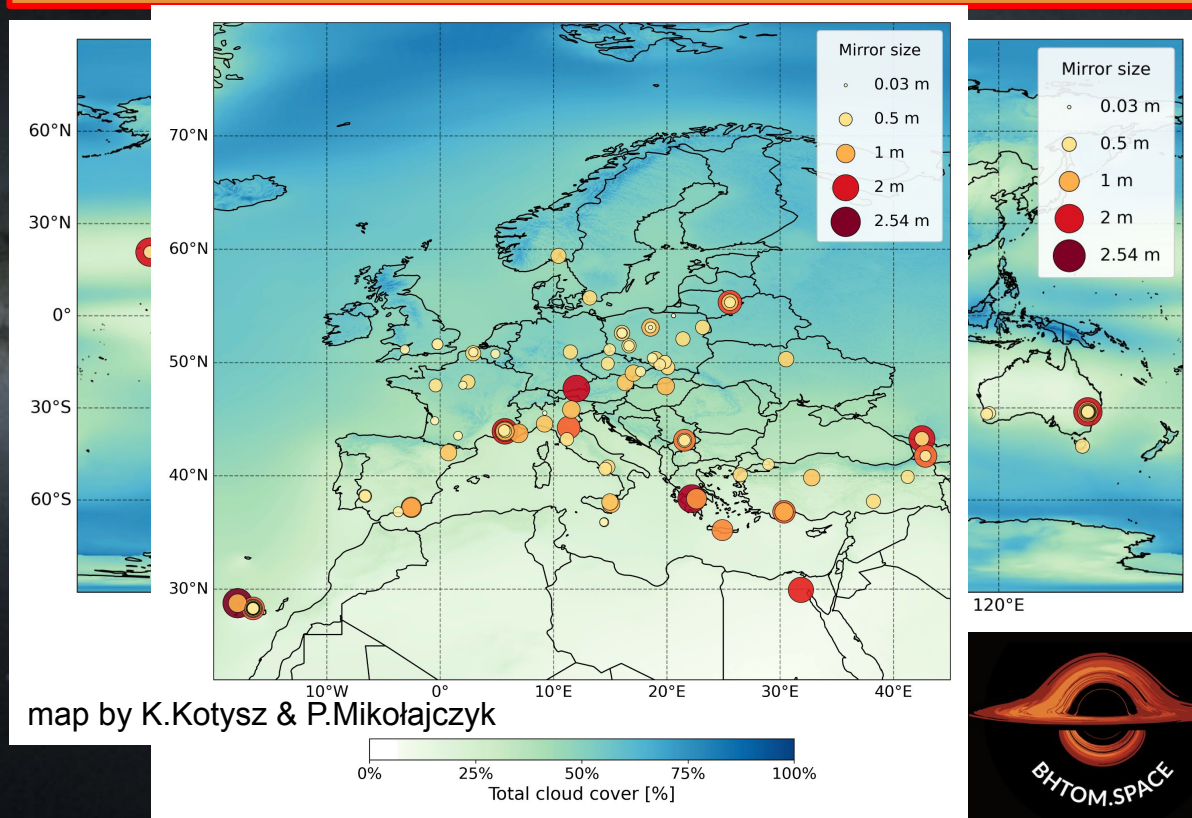
Black Hole Target and Observation Manager: BHTOM



Around 170 telescopes
Sizes 0.03 - 2.5 m
Professional
Amateur
Schools
Outreach facilities
Manual
Robotic
With good weather
With poor weather
Volunteering
Via proposals



BHTOM: Network



map by K.Kotysz & P.Mikołajczyk

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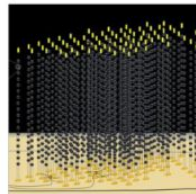
BHTOM as part of ACME



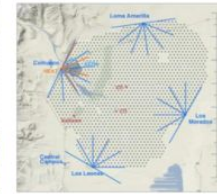
ACME (the Astrophysics Centre for Multi-messenger studies in Europe) is set up to realize an ambitious coordinated European-wide optimization of the accessibility and cohesion between multiple leading research infrastructures, offering access to instruments, data and expertise, focused on the new science of multi-messenger astrophysics



KM3NeT (neutrino)



Auger Prime (UHECR)



VIRGO (gravitational waves)



LOFAR (radio band)



INTEGRAL (hard X-ray)



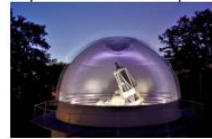
MAGIC (gamma-ray band)



Radio-telescope networks



Optical - small telescopes



Optical - large telescopes



BHTOM: science ready light curves

Fully automated data processing - Aperture and PSF photometry.
Standardisation of observations from any filter to Gaia Synthetic Photometry.
Downloadable and science-ready - for registered users.

SN2024ggi, GoChile-40cm



Gaia24amo, LCO-1m

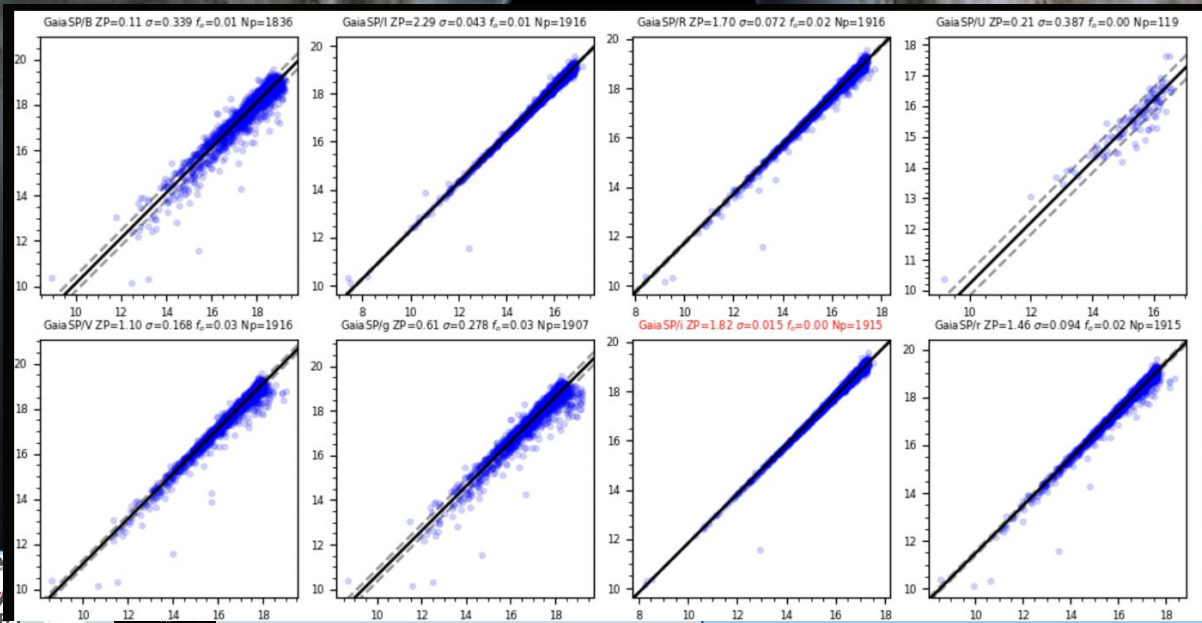


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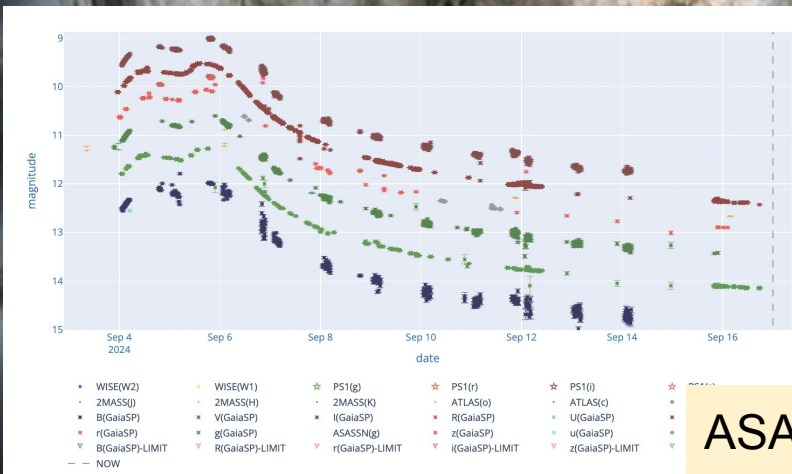
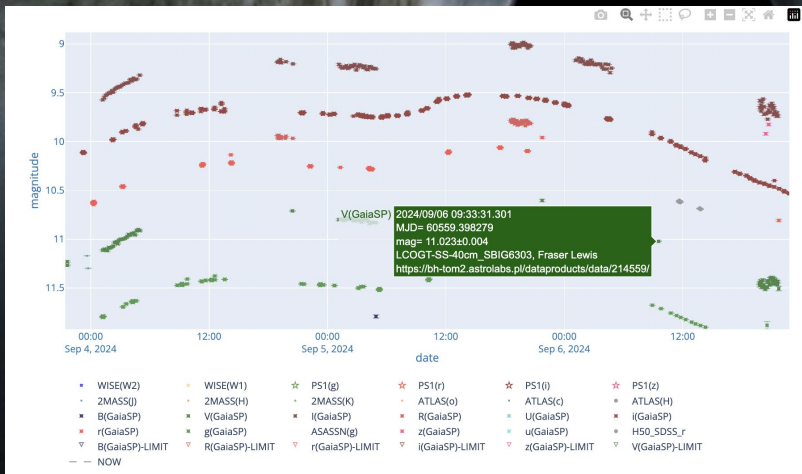


Automated detection of filter and zero-point fit to Gaia Synthetic Photometry.

BHTOM: science ready light curves

All contributing observations are labelled on light curves.

Credit is given to all observers - everyone is invited to co-author a publication or a research note (ATel, AstroNote).



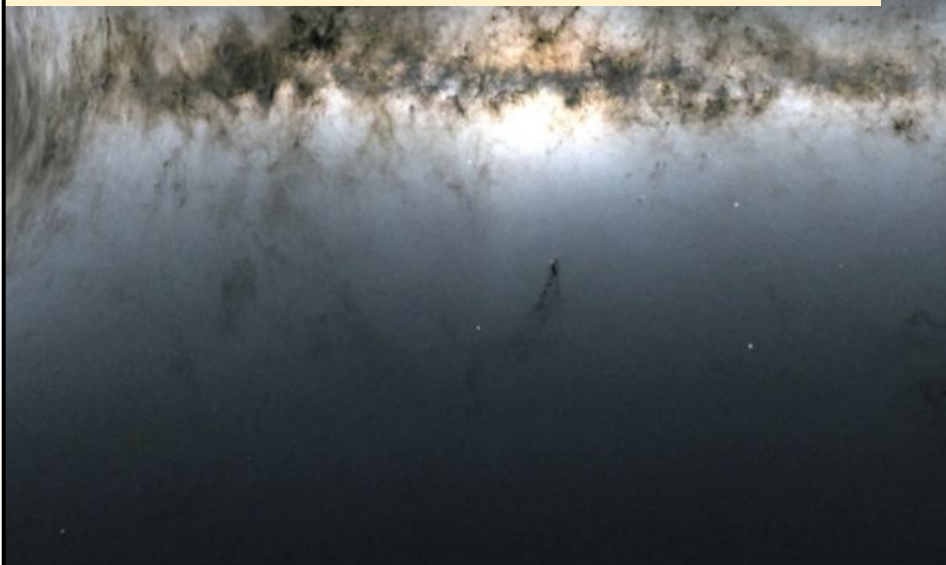
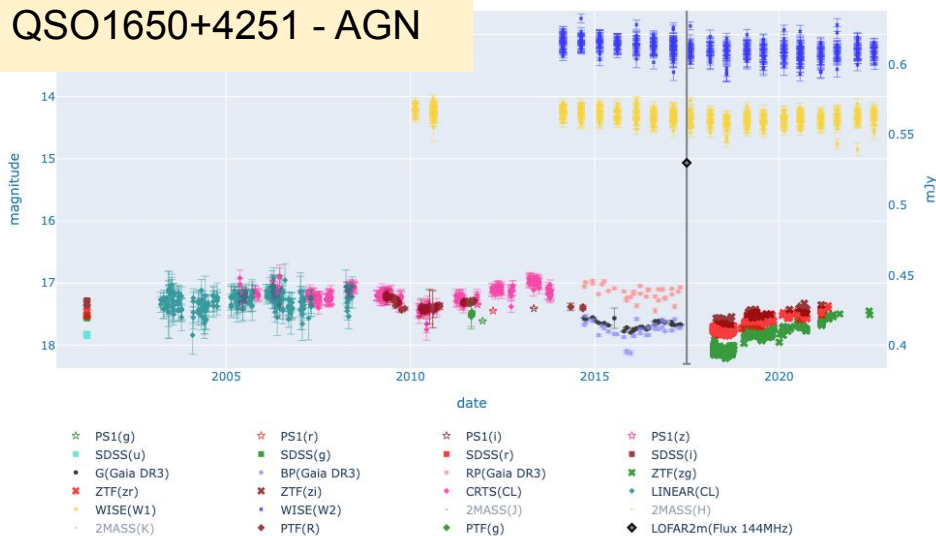
ASASSN-24fs:
>3000 frames

BHTOM: science cases

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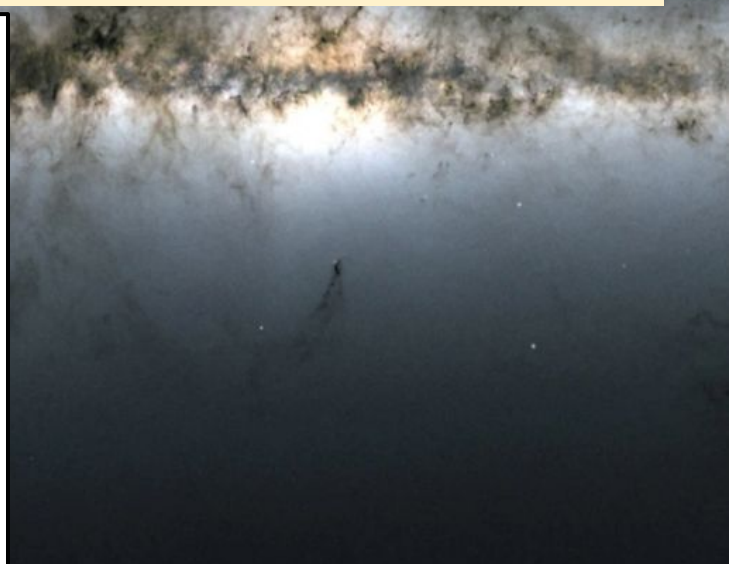
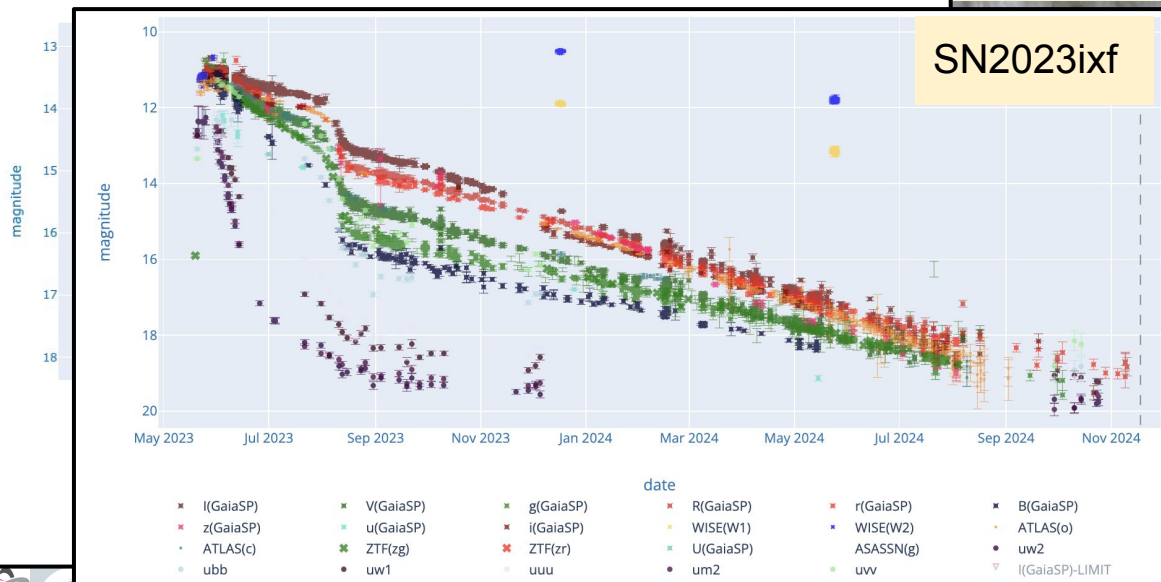
QSO1650+4251 - AGN



BHTOM: science cases

All contributing observations are labelled on light curves.

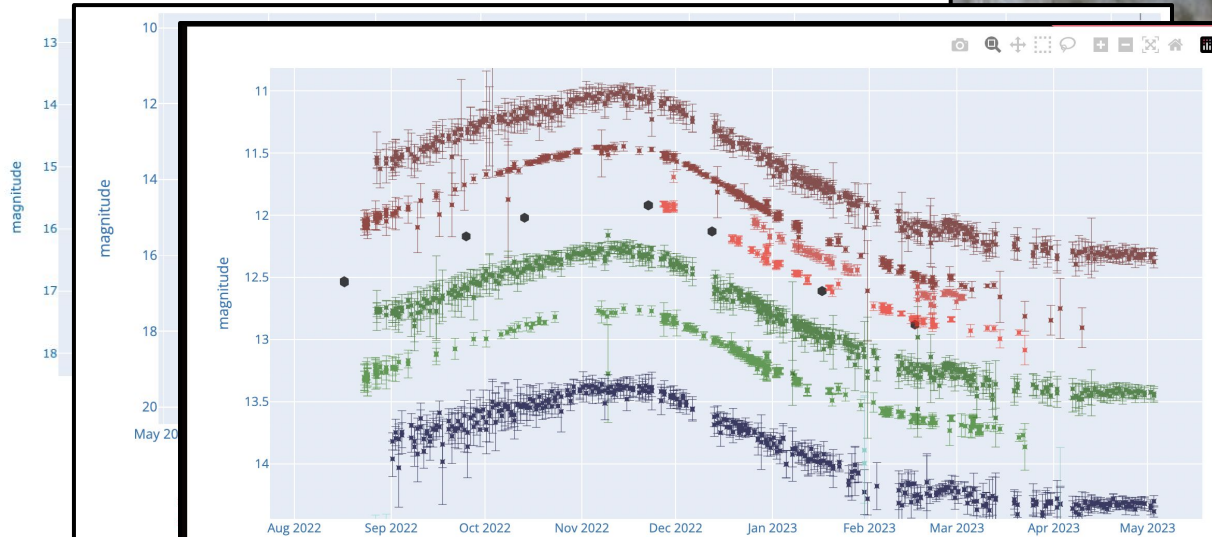
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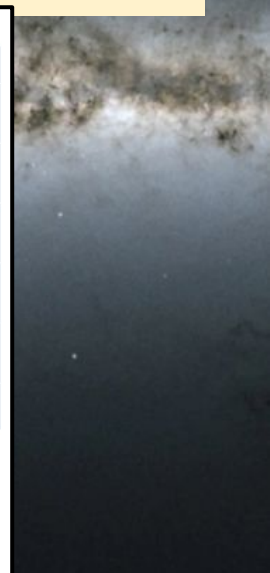
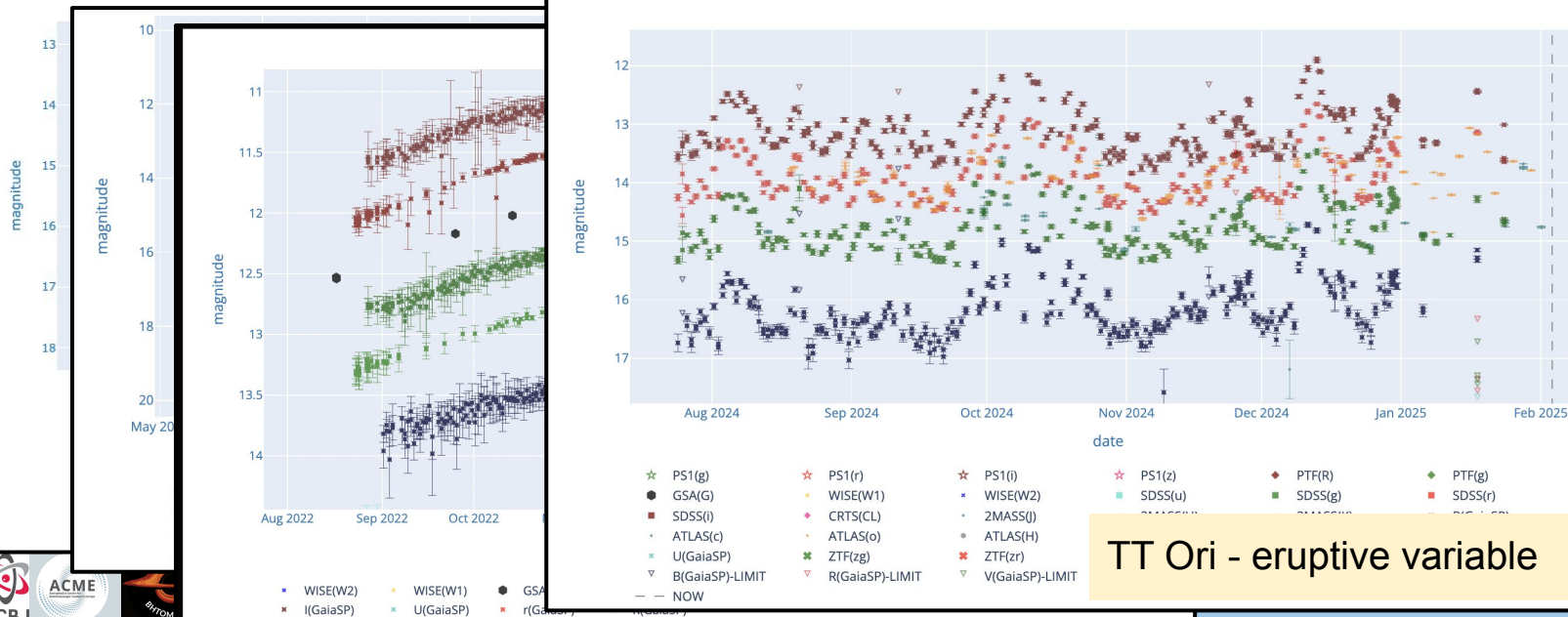
Gaia22dkv -planetary microlensing event



BHTOM: science cases

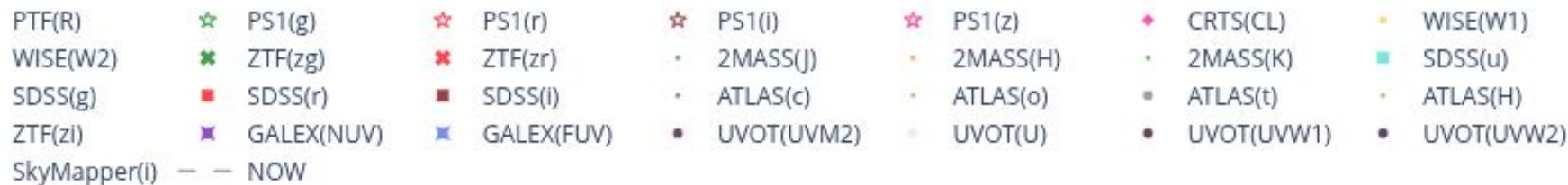
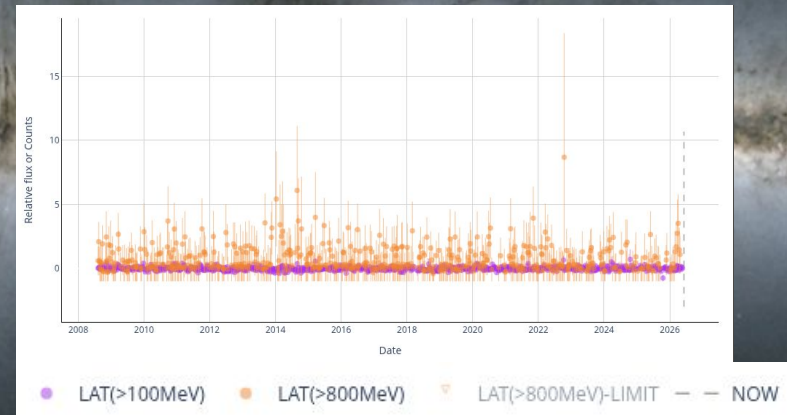
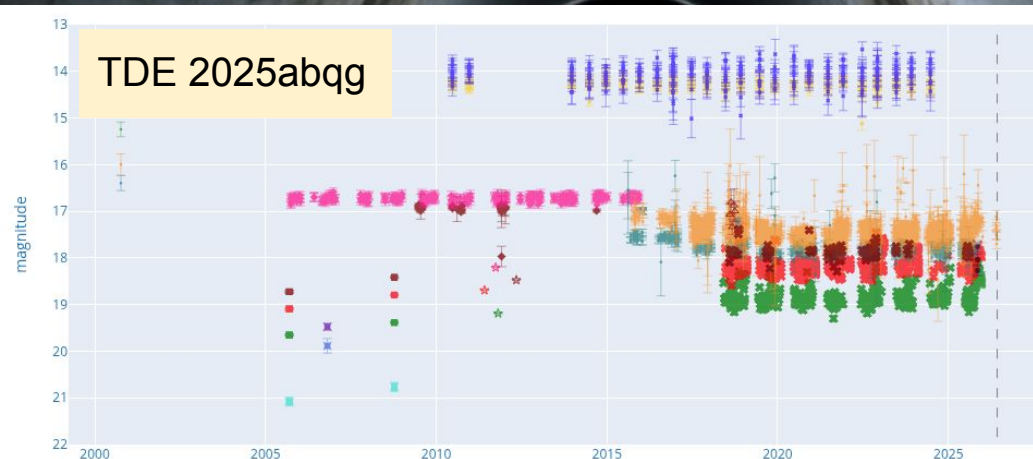
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BHTOM: archival information

Automated harvesting of archival time-domain public data for all targets.
Including: Optical, NIR, Radio, UV, Gamma-rays, etc.



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Automated harvesting of archival time-domain public data for all targets.
Including: Optical, NIR, Radio, UV, Gamma-rays, etc.

LSST_313994139532263447

Name LSST_313994139532263447
[Public Target Link](#)

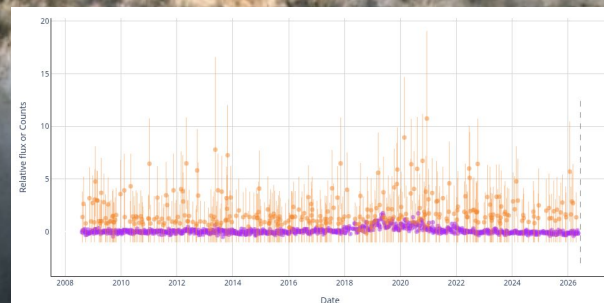
Target ID 8337
 Ra,Dec 53.251362 -27.861039
 03:33:00.327 -27:51:39.740
 223.693013 -54.327459

Galactic (l,b)
 Constellation Fornax
 Discovered 2026-02-28 00:00:00
 Class Unknown
 Description SNe candidate classified by Fink using the public Rubin LSST stream. Now at magnitude 19.4, and peak not yet reached. Two nearby sources within 5 arcseconds reported decades ago.

Phot.Class --
 Last MJD 61135.731538

Photometry **Photometry** Models Spectroscopy Publication Manage Data Manage Groups
 Per Observatory

Photometry



● LAT(>100MeV) ● LAT(>800MeV)

- | | | | | |
|--------------------|-----------------|--------------------|--------------------|-----------------|
| ◆ PTF(g) | ◆ PTF(R) | ◆ WISE(W1) | ◆ WISE(W2) | ASASSN(V) |
| ◆ ASASSN(g) | ◆ SkyMapper(g) | ◆ SkyMapper(r) | ◆ SkyMapper(l) | ◆ SkyMapper(z) |
| ◆ ATLAS(o) | ◆ ATLAS(c) | ◆ ATLAS(H) | ◆ GALEX(NUV) | ◆ GALEX(FUV) |
| ◆ UVOT(UVW2) | ◆ UVOT(UVM2) | ◆ UVOT(U) | ◆ UVOT(UVW1) | ◆ UVOT(V) |
| ◆ UVOT(B) | ◆ r(GaiaSP) | ◆ l(GaiaSP) | ◆ LSST(z) | ◆ LSST(r) |
| ◆ LSST(l) | ◆ CRTS(CL) | ◆ UVOT(V)-LIMIT | ◆ UVOT(UVW1)-LIMIT | ◆ UVOT(B)-LIMIT |
| ◆ UVOT(UVM2)-LIMIT | ◆ UVOT(U)-LIMIT | ◆ UVOT(UVW2)-LIMIT | --- | --- |

BHTOM: API

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

AUTHORIZATION API: /api/token-auth/

Description

The `token-auth` API provides a method for users to obtain an **authentication token** by submitting their `username` and `password`. Once you have acquired this token, it allows you to access and utilize all other available APIs.

Endpoint

- Method: POST
- URL: `/api/token-auth/`









Request Parameters

- `username` (string, required): User's username for authentication.
- `password` (string, required): User's password for authentication.

Example Request

```
curl -X 'POST' \  
  'https://uploadsvc2.bh-tom2.astro.uw.edu.pl/calibFile/' \  
  -H 'accept: application/json' \  
  -H 'Authorization: Token <yourToken>' \  
  -H 'Content-Type: application/json' \  
  -H 'X-CSRFToken: uUz2fRnXhPuvD9YuuIDW9cD1LsajeaQnE4hwtEAfR00SgV9bD5HCe5i8n4m4Kc0r' \  
  -d '{  
    photmetry_file = 'file.dat'  
    ra = 1.23  
    dec = 4.56  
    match_dist = 2.0  
    no_plot = True  
    survey = 'GaiaSp'  
    filter = 'V'  
    image_format = 'png'  
  }'
```

Workshops

 2010-Cambridge
  2011-Cambridge
  2012-Bologna
  2013-Paris
  2014-Warsaw
  2015-Liverpool
  2016-Utrecht
  2017-Warsaw



GAIA SCIENCE ALERTS WORKSHOP

19-21 June 2010, IAP, Paris



Gaia Science Alerts Verification and Follow-up Workshop

19-21 June 2011, IAP, Paris



GAIA SCIENCE ALERTS WORKSHOP

Bologna 6-7 September 2012



Gaia Science Alerts

19-21 June 2013, IAP, Paris



FIFTH GAIA SCIENCE ALERTS WORKSHOP

UNIVERSITY OF WARSAW 9-12 SEPTEMBER 2014



Gaia Science Alerts Workshop 2015

19-21 November 2015



7th Gaia Science Alerts Workshop

7-9 December 2016 * SRON Utrecht NL



8th Gaia Science Alerts Workshop

6-8 December 2017 Warsaw, Poland




The 9th OPTICON GAIA SCIENCE ALERTS WORKSHOP

8-10 October 2018 Vipava, Slovenia



10th OPTICON Gaia Science Alerts Workshop

10-12 November 2019



11th OPTICON Gaia Science Alerts Workshop

18-20 January 2020



12th GAIA SCIENCE ALERTS WORKSHOP

2021 NOV 8-12



13th ORP and Gaia Science Alerts Workshop

4-7 October 2022 Pula, Sardinia



14th Gaia Science Alerts and ORP Time-Domain Workshop

2-5 October 2023



15th GAIA SCIENCE ALERTS AND ORP TIME-DOMAIN WORKSHOP

2-5 October 2024



16th GAIA SCIENCE ALERTS AND ACME TIME-DOMAIN WORKSHOP

28 Sep-3 Oct 2025

Workshops

17TH GAIA SCIENCE ALERTS AND ACME TIME-DOMAIN WORKSHOP

Frejus, France
31 Aug-4 Sep 2026



11 YEARS OF GAIA SCIENCE ALERTS

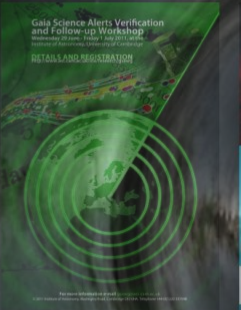
- future space transient missions
- LSST alert streams
- telescope network
- BHTOM follow-up system
- citizen science and small telescopes
- synergies with multimessenger facilities
- solar system alerts

Workshop Organising Committee:
 Lukasz Wyrzykowski (OAUW, NCBJ, EASST)
 Stephane Basa (LAM, Marseille)
 Michel Dennefeld (IAP, Paris)
 Fraser Gillan (NCBJ, Warsaw)
 Priscila Pessi (NCBJ, Warsaw)
 Simon Hodgkin (IoA, Cambridge)
 Justyna Olszewska (UAM, Poznan)

<https://bit.ly/gaia-alerts-2026>



2011-
Cambridge



2019-Catania



Priscila.Pessi@ncbj.gov.pl

Liverpool

2016-Utrecht



2017-Warsaw



2023-Catania

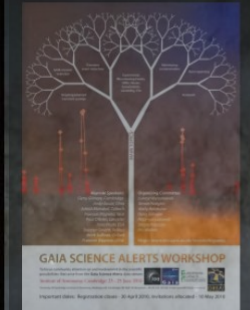
2024-Crete



2025-Tenerife



2010-Cambridge



2018-Vipava



NCBJ, ACME, OPTIMSPACE logos

Summary

- BHTOM is a free tool giving you access to a global network of telescopes.
- Any time-domain source can be requested.
- Involves your telescope in a global network.
- Provides long-term multi-wavelength standardized photometry for any target.
- Access to many archives.
- Solar System objects follow up being developed (see Gillan+2026, [Time-Domain Photometry and Activity Evolution of Interstellar Comet 3I/ATLAS with BHTOM](#))
- Plans: Multi-messenger targets (GW, neutrinos)
- Plans: More archives (multimessenger, X-ray, etc.)

[Stay tuned for the new version of BHTOM and its implementation on Fink!](#)



**THANK
YOU!!**

bhtom.space



Priscila.Pessi@ncbj.gov.pl

Fink@World 2026