



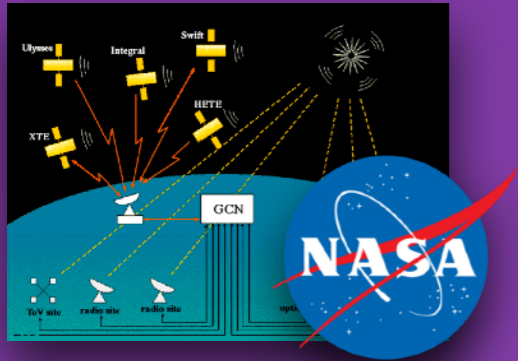
Astro-COLIBRI

COincidence LIBrary for Real-time Inquiry for multi-messenger astrophysics

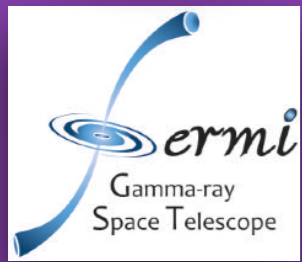
Fabian Schüssler (IRFU, CEA Paris-Saclay)



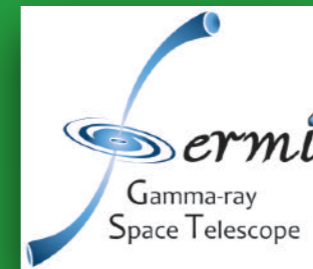
Main idea



TRANSIENT NAME SERVER



...



...



Web interface

Astro-COLIBRI

Select action

Latest transients

Cone search

Personalize



Status: **logged out**

Infos: **✓ v2.3.0**

Observatories: Swift Fermi HAWC IceCube AMON Integral GECAM FLAapLUC LVC other

Event type: FRB OT SN GRB burst neutrino GW nuem 4FGL TeVCAT SGR/AXP



AT 2023auj
Optical transient

RA/Dec: 217.59°/-30.20°
2023-01-26 08:07:22

NuEm-230125A
Neutrino - Gamma rays

RA/Dec: 198.23°/59.51° (± 0.23°)
2023-01-25 13:13:35

AT 2023aio
Optical transient

RA/Dec: 157.76°/-15.75°
2023-01-24 00:02:09

Gamma-ray burst

RA/Dec: 40.86°/-65.69° (± <0.00°)
2023-01-23 10:22:33

Neutrino

RA/Dec: 16.79°/7.78° (± 3.11°)
2023-01-22 03:50:02

MS230110g
Gravitational wave

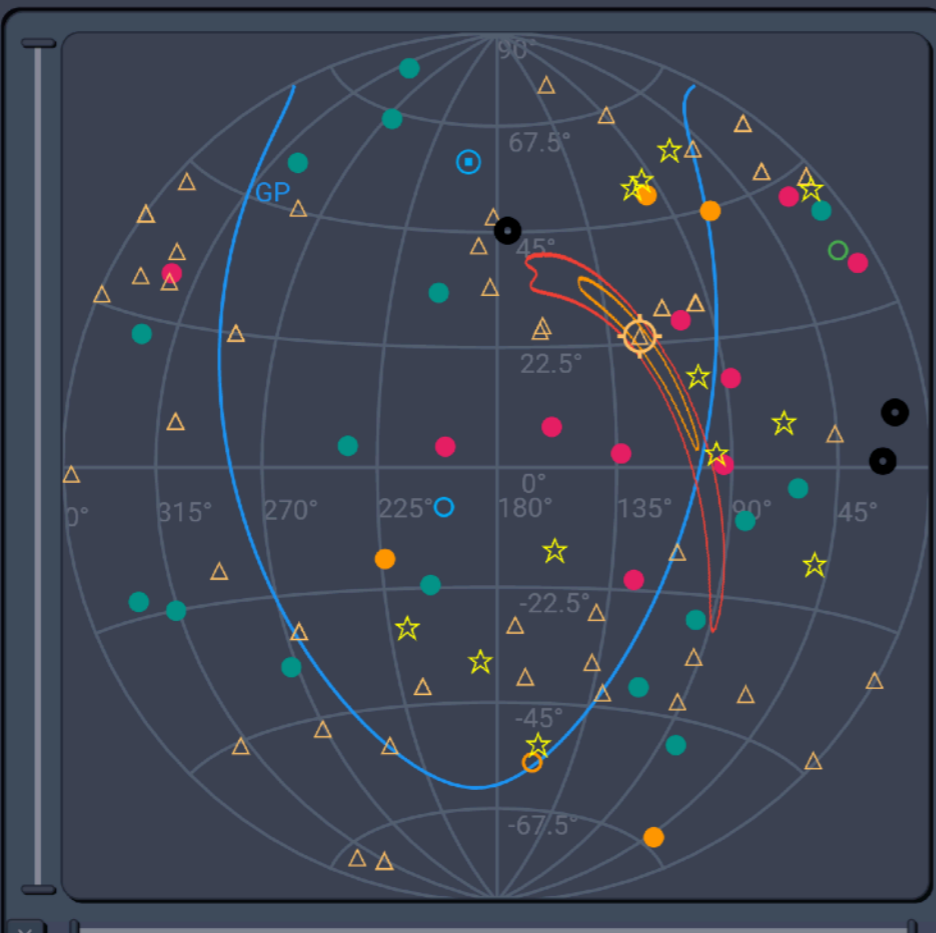
Cone search

Custom cone search

RA / Dec: 122.34° 23.89°

source: MS230110g

radius: < 1° >



Detailed info about selected source: science mode

VoEvent: [XML](#) VoEvent: [JSON](#) History: #0 #1 #2

name: **MS230110g**

Detection time: 2023-01-10 06:05:42

RA [deg]: 122.34 Dec [deg]: 23.89

RA : 8h9m22.5s Dec : 23d53m16.31s

observatory: LVC instrument: H1,L1 discovery name: MS230110g

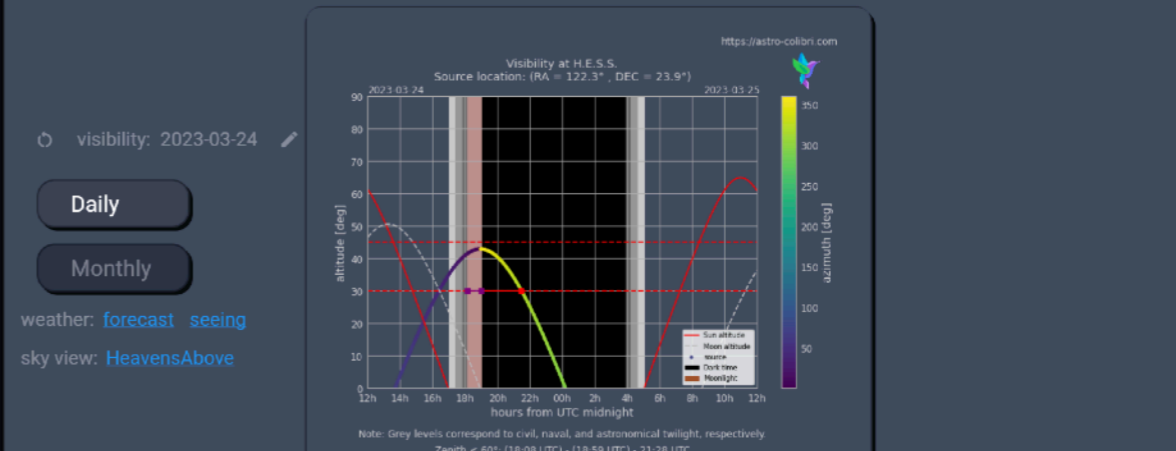
pipeline: gstlal classification: BNS: 1.00

distance: 149 ± 42 Mpc

FAR: 2.88e-6/yr

50% area: 170 deg² 90% area: 687 deg²

[Search for ATels!](#)



Links for further details auto scroll

- [GraceDB](#): Information on the gravitational wave event
- [ALADIN](#): Displays event in an interactive sky atlas
- [ESASky](#): Displays event in an interactive sky atlas
- [Pan-STARRS](#): Archival reference images of the Northern sky
- [Fink](#): Broker providing real-time transient classification
- [Web detec \(DR1\)](#)

<https://astro-colibri.com>



Preparations for O4

Astro-COLIBRI interface showing search filters and detailed information for source MS230110g.

Search Filters:
Observatories: Swift, Fermi, HAWC, IceCube, AMON, Integral, GECAM, FLAapLUC, LVC, other
Event type: FRB, OT, SN, GRB, burst, neutrino, GW, nuem, 4FGL, TeVCAT, SGR/AXP

Timeline: 2023-01-01 to 2023-02-01

Selected Source: MS230110g (Gravitational wave)

Custom cone search: RA / Dec: 122.34 23.89°, source: MS230110g, radius: 1°

Detailed info about selected source:
VoEvent: [XML](#) VoEvent: [JSON](#) History: [#0](#) [#1](#) [#2](#)
name: MS230110g
Detection time: 2023-01-10 06:05:42
RA [deg]: 122.34 Dec [deg]: 23.89
RA : 8h9m22.5s Dec : 23d53m16.31s
observatory: LVC instrument: H1,L1 discovery name: MS230110g
pipeline: gstlal classification: BNS: 1.00
distance: 149 ± 42 Mpc
FAR: 2.88e-6/yr
50% area: 170 deg² 90% area: 687 deg²

[Search for ATels!](#)

Visibility at H.E.S.S.: Source location: (RA = 122.3°, DEC = 23.9°)
Graph showing altitude (deg) and azimuth (deg) vs hours from UTC midnight (2023-03-24 to 2023-03-25). Legend: Sun altitude, Moon altitude, source, Dark time, Moonlight.

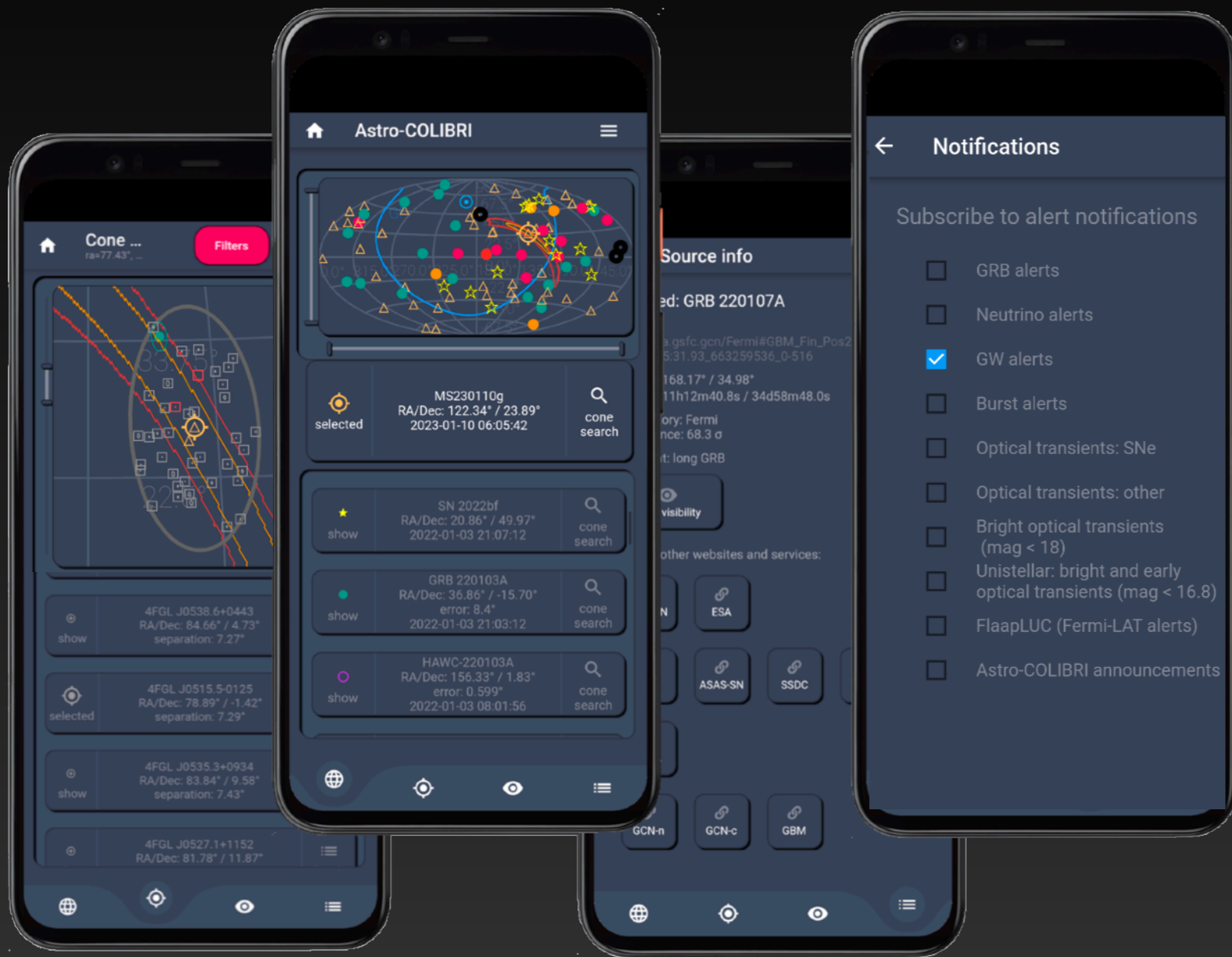
ALADIN: Displays event in an interactive sky atlas
ESASky: Displays event in an interactive sky atlas

GraceDB: Information on the gravitational wave event

<https://astro-colibri.com>



Android + iOS



- Extensions for O4
 - Sub-threshold events
 - HasNS > 50%
BNS (+ NSBH) > 50%
 - ...
- Feedback very welcome

Alert notifications in real-time



Astro-COLIBRI

- Astro-COLIBRI: automatic platform providing easy access to
 - transient detections (gamma-ray bursts, fast radio bursts, tidal disruption events, supernovae, optical transients, high-energy neutrinos, **gravitational waves**, etc.)
 - interfaces: web + Android + iOS
- Version 1.0 released in August 2021 (new releases roughly every 1-2 months)
 - >400 users/month (professional + amateur astronomers)
- Various new features in preparation for O4
 - Finer grained realtime notifications
 - Cone searches in the full uncertainty region (currently 10deg around the hottest spot)
 - Follow-up scheduling (tiling, galaxy targeting)
 - ...



Astro-COLIBRI

Contact: astro.colibri@gmail.com

- Central webpage: [**https://astro-colibri.science**](https://astro-colibri.science)

Android Play Store



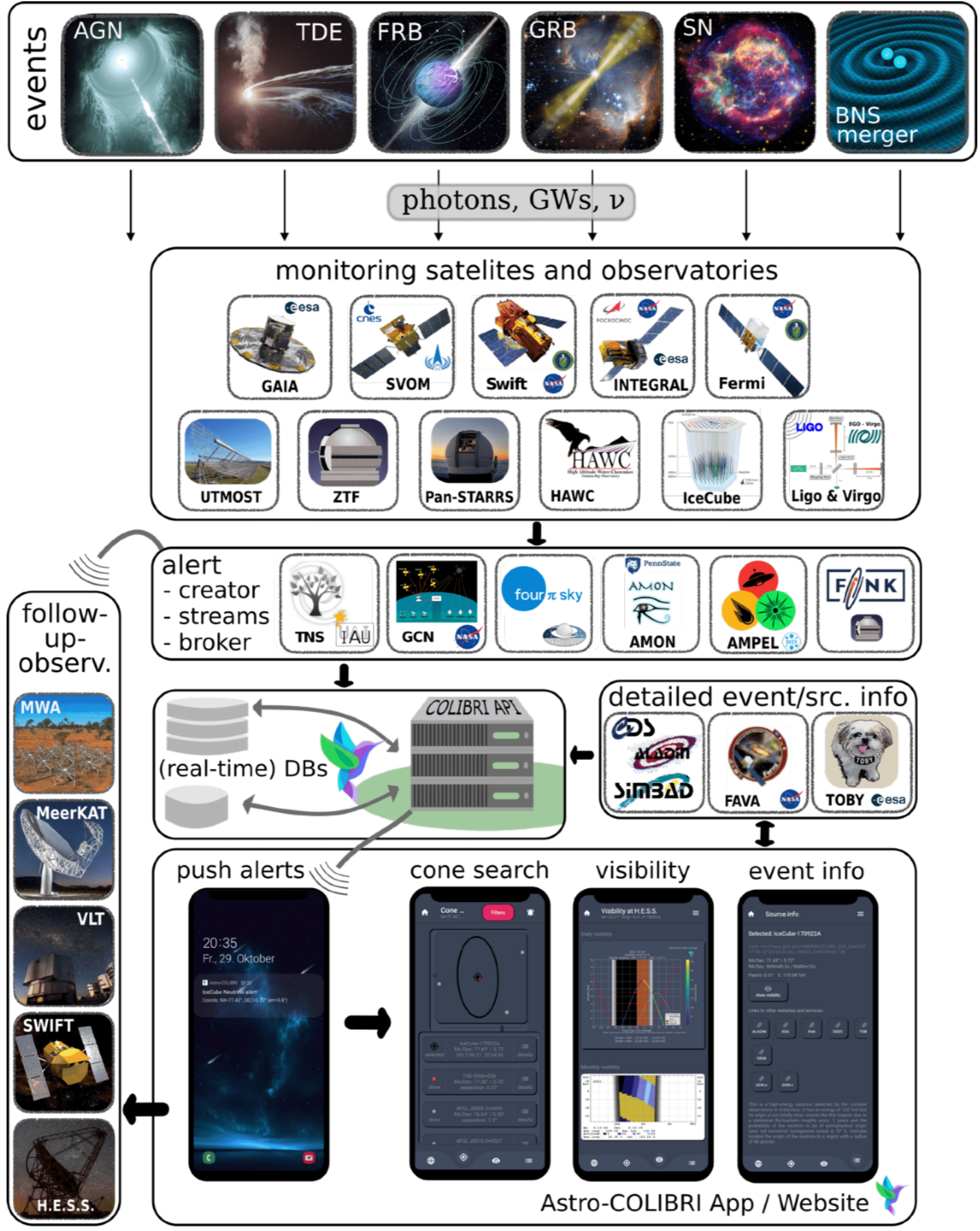
Apple iOS App Store



Introductions/tutorials on YouTube



Twitter: @AstroColibri





Architecture

