



IVOA May 2021

ASTRO -COLIBRI astro-colibri.com

The coincidence library for real-time inquiry for multi-messenger astrophysics

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Motivation for Astro-COLIBRI

- Flares of known stable astronomical sources and transient sources can occur on different timescales
- Improve multi-messenger/wavelength follow-up:
 - Quickly acquiring an overview over both stable sources and transient events in the relevant phase space

What we need

- Automatically collect
 - Archival data
 - Transient activity data over various timescales
 - Summarize it in human and machine-readable formats
- Provide an (interactive) graphical representation
 - Multi-wavelength and multi-messenger data
 - Filtering in space & time
- Correlate transient alerts automatically
- Connect to alert reception & link to real-time analyses



Motivation for Astro-COLIBRI

Challenges in the real-time analysis of the transient sky

- Many processes are not automatized in observatories
 - Error-prone
 - Time consuming
 - Incomplete
- Decisions to trigger observations and/or update scheduled observations may need to be taken by non-experts (e.g. tired on-site shift crews, etc.)"
 - **Decision Helper**

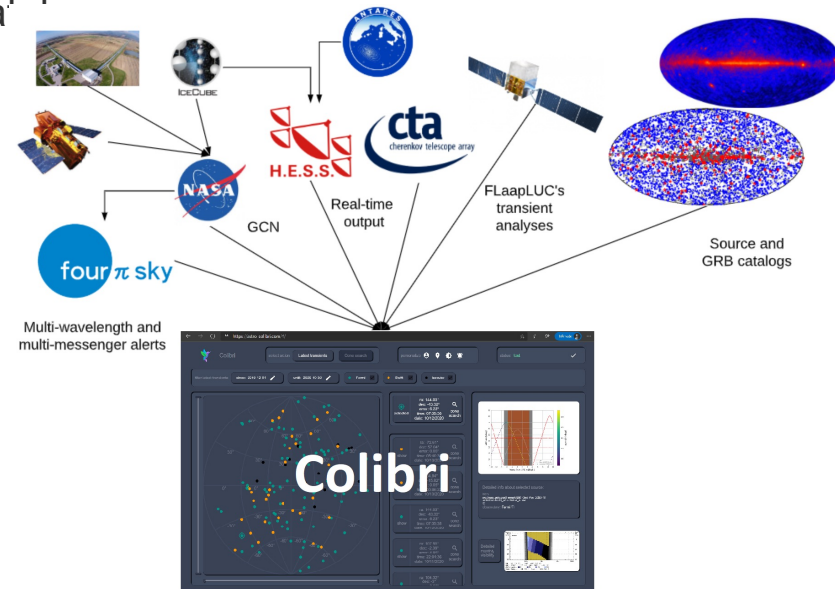
→ Need for automated access to all necessary information for prompt prioritization



Architecture

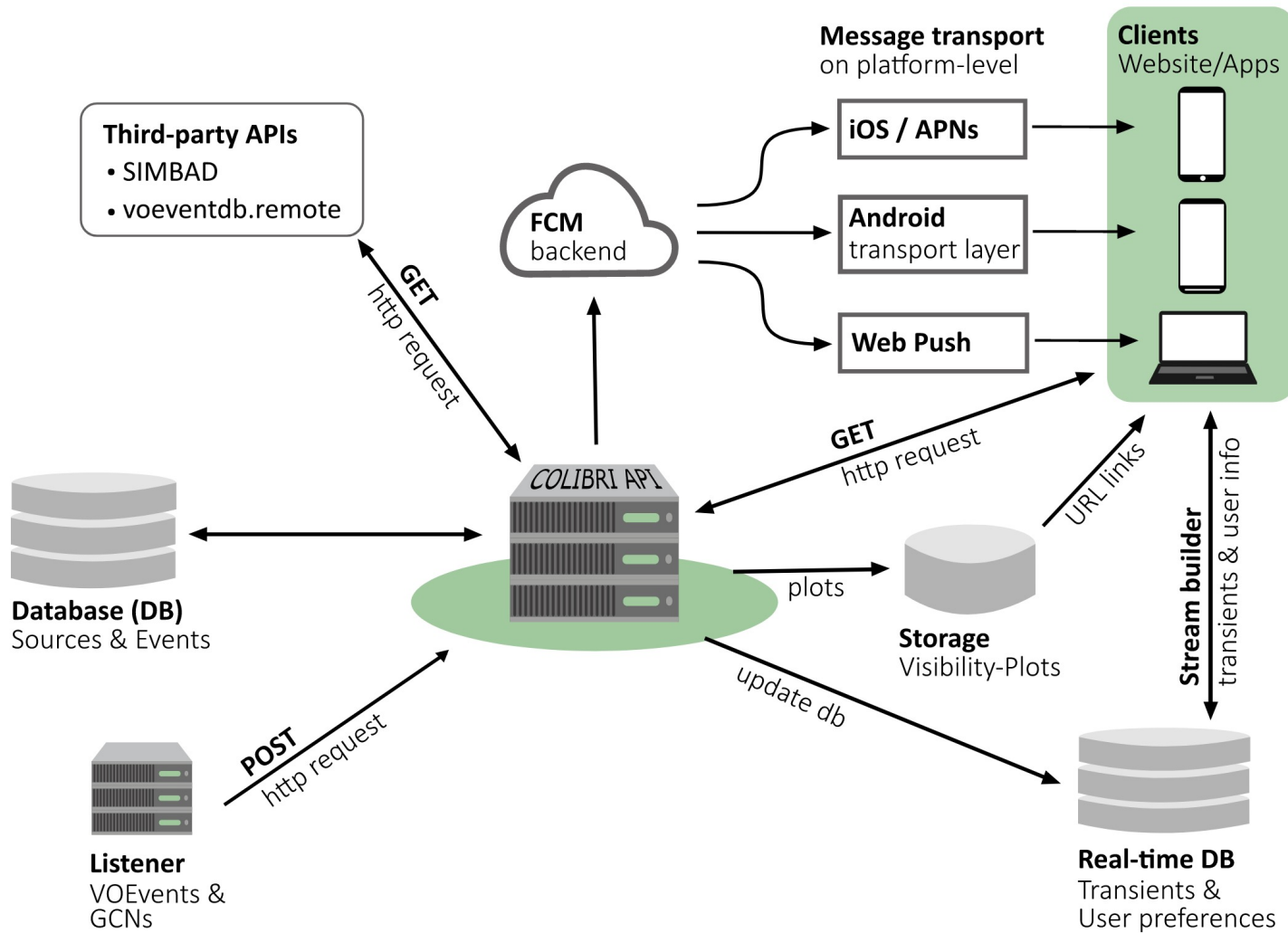
Building on existing systems

- Astro-COLIBRI is using existing alert systems and catalogs
 - VoEvent alerts (via 4pisky)
 - AMON alerts
 - TNS notifications (FRBs + TDE)
 - GCN circulars
 - Fermi-LAT (4FGL + FlaapLUC + FAVA)
 - TevCat catalog
 - Observatories private informations
 - Soon : LSST, ZTF, GWs, GBM maps ...



- Astro-COLIBRI aims to be the top layer that combines existing subsystems to one large ecosystem
- Dedicated also to humans through an intuitive GUI
 - Makes communication about possible observations easy
 - In some cases the observation committee needs to be convinced

Architecture



Main fonctionnalités

- User account
 - Personal preferences: data access, location, notifications
- Filter on types or observatories / wavelentgth
- Cone search : Auto zoom arround transient event with position error
 - Autocompleting existing source and custom position
- Links on standards catalogs to get more details
- Visibility plots from selected location



Demo : astro-colibri.com

Outlook

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- First official release soon
 - Already accessible at astro-colibri.com
- Distribute mobile app via Google Play store and iOS App store
- Distribute among burst advocates in observatories
- Links or implementation within the real-time analyses frameworks of current (and future) observatories
- Near-time goal: VO compatibility of the Astro-COLIBRI API (i.e. returning VoTable for cone searches)
- Mid-term goal: link to ObsVisSAP and ObsLocTAP
- Ideas and feedbacks welcome ! astro.colibri@gmail.com

