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# COLIBRI  astro-colibri.com

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

Valentin Lefranc on behalf
of the COLIBRI development team

# Motivation for Colibri

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- 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 Colibri

Challenges in the real-time analysis of the transient sky

- Many processes are not automatized in observatories
    - Error-prone
    - Time consuming
    - Incomplete

- Decision processes for schedule updates and alert issues may need to be taken by non-experts (e.g. tired shifters)
    - **Decision Helper**

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

# Architecture

# Building on existing systems

- Colibri will use existing alert systems and catalogs (incomplete list):
  - VoEvent alerts (via 4pisky)
  - AMON alerts
  - TNS notifications (FRBs + TDE)
  - GCN circulars
  - Fermi-LAT (4FGL + FlaapLUC + Fava)
  - TevCat catalog
  - **Internal Observatory alerts (requiring user privilege)**

  <u>Soon</u>

  LSST, ZTF, GWs, GBM maps ...
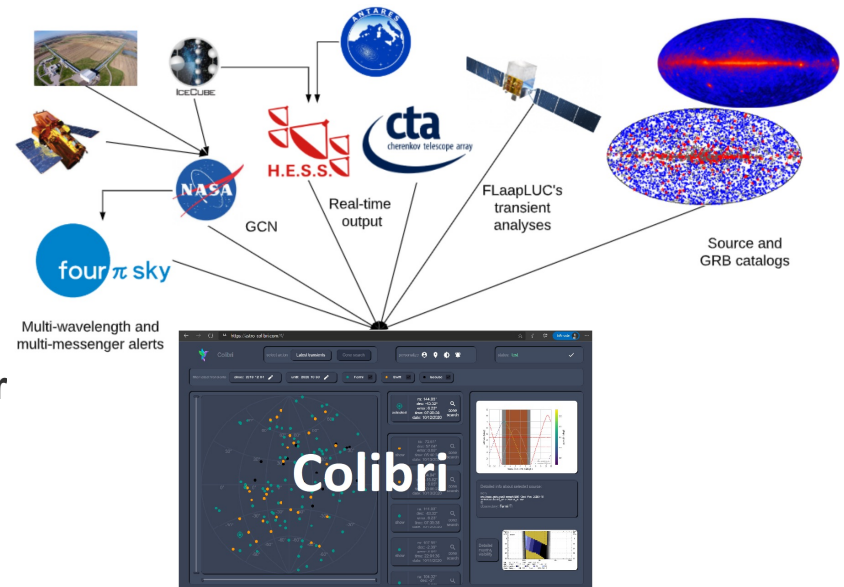


- Colibri aims to be the top layer that combines existing subsystems to one large ecosystem
- Dedicated also to humans through an intuitive GUI
  - Makes communication about possible observations easy
  - In some cases the observation committee needs to be convinced

# Architecture

source: elements copied from the firebase website
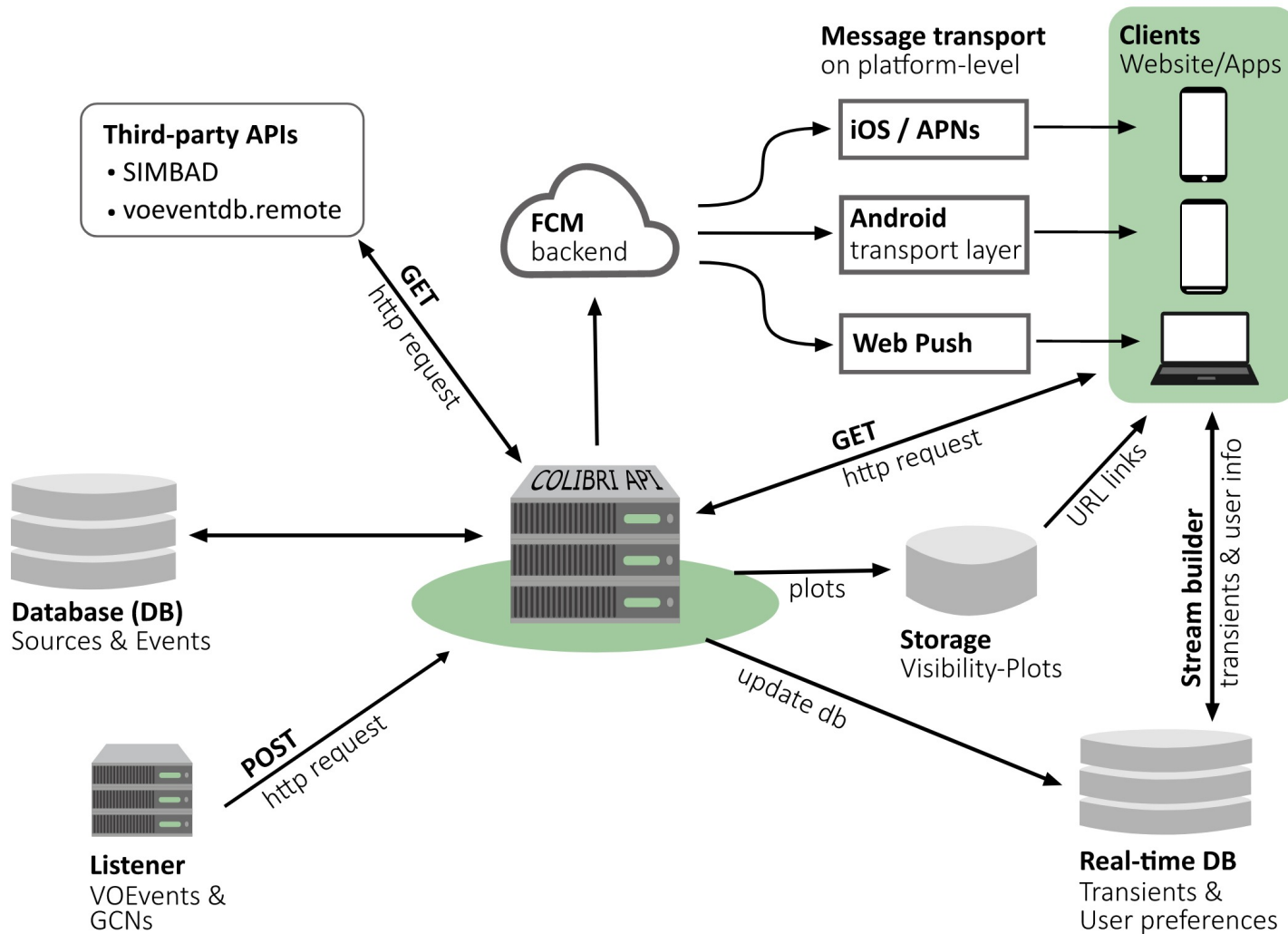
# Main fonctionnalities

- User account

  - Personal preferences: data access, location, notifications

- Filter on types or observatories / wavelentgth

- Cone search : Auto zoom arround event with position error

  - From 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

- Ideas and feedbacks welcome !