



Astro-COLIBRI

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The multi-messenger revolution is building on a strong foundation of a huge amount of effort towards rapid and largely automatic dissemination of data analyses and results. These publicly accessible tools include alert distribution networks and brokers (e.g. GCN, TNS, ATEls, etc.), visualization tools like ALADIN and ESA-Sky, databases like SIMBAD and NED, as well as portals to information of individual observatories (e.g. FAVA and Fermi-LCR for Fermi-LAT, the ZTF and Vera Rubin Observatory brokers, etc.). These tools are run by experts and provide access to the wealth of information obtained by the worldwide networks of observatories. Time-domain (and multi-messenger) astronomy has become more and more relevant for many observatories over the years. This naturally led to an increased in the number of detections, alerts, and follow-up opportunities. Combined with the need for reactions in real-time to catch the most violent explosions in the universe, many traditional and largely manual procedures to get informed about and react to new phenomena reached saturation. The need for novel approaches and new, modern tools has become urgent.

In this context we have developed “Astro-COLIBRI”, a platform that evaluates alerts of transient observations in real time, filters them by user-specified criteria, and puts them into their multiwavelength and multimessenger context. The aim is not to replace the existing landscape of systems and platforms but to provide a central entry point that allows to keep track of the ever-increasing alert rate, provide easy access to the expert systems and thus facilitate multi-messenger follow-up observations.

Through fast generation of an overview of persistent sources as well as transient events in the relevant phase space, Astro-COLIBRI contributes to an enhanced discovery potential of both serendipitous and follow-up observations of the transient sky. The software's architecture comprises an Application Programming Interface (API), both a static and a real-time database, a cloud-based real-time alert system, as well as a website (<https://astro-colibri.com/>) and apps for [iOS](#) and [Android](#) as clients for users. The latter provide a graphical representation with a summary of the relevant data to allow for the fast identification of interesting phenomena along with an assessment of observing conditions at a large selection of observatories around the world. Astro-COLIBRI combines information traditionally scattered across several platforms (e.g. FRBs, SNe, TDEs and other optical transients from TNS as well as GRBs, GWs and high-energy neutrinos announced on GCN). For each event dedicated links provide direct access to a large number of additional and external services. Using cutting edge mobile technology, Astro-COLIBRI has become a central point of accessing information about astrophysical sources and transient events.

Continuous feedback, input of new ideas, as well as contributions to further developments and improvements from the community (comprising both professional and amateur astronomers) are highly welcome.

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