

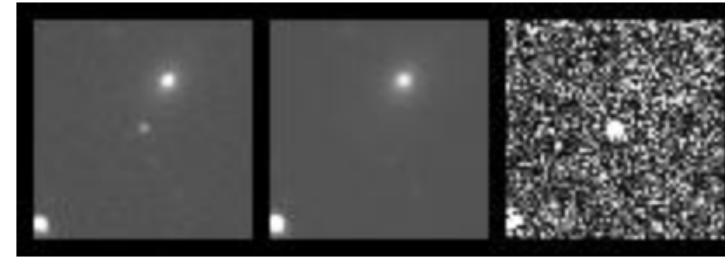
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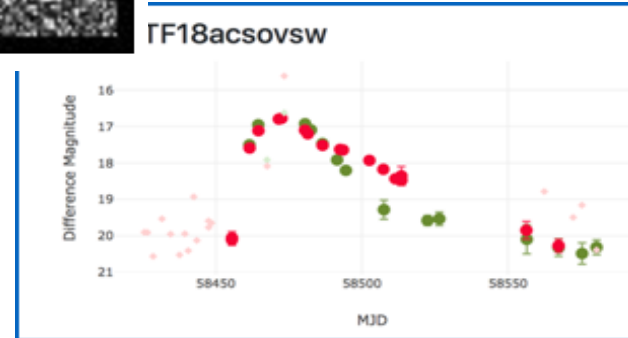
Abstract

We are building an *event broker* to help astronomers worldwide receive, classify, filter, and take action on the millions of nightly alerts expected to come from the Vera Rubin Observatory (aka LSST) starting in 2022. We have a working prototype called *Lasair* which is processing alerts from the Zwicky Transient Facility (ZTF) and is already being used to do science.



Alerts discovered in difference image

TF18acsovsw



Light curve evolving over days

Project Description

The time domain is the new frontier of astrophysics, focusing on dramatic events, transients, and moving objects – supernovae, gamma-ray bursts, near-earth asteroids, tidal disruption events, and gravitational wave events. A new breed of wide angle telescopes (PanSTARRS, ZTF, and soon LSST) survey the sky repeatedly looking for things that change. Astronomers will not get the alerts directly from the telescope, but through third party *event brokers*, which add context (e.g. is there a known object there?) and allow filtering, classifying, querying and feeding onwards to follow-up facilities such as spectrographs. A handful of brokers exist around the world, one of which is *Lasair* – which means “flame” or “flash” in both Irish and Gaelic.

Key Results and Impact

- Processing $\sim 10^5$ alerts per night from ZTF
- Planning for $\sim 10^7$ alerts per night from LSST
- Enabling new science worldwide
- Rich added value contextual information
- Flexible querying and filtering interface
- Powerful datamining through Jupyter Hub service
- Data is *pushed* to astronomers and their robots

Website: lasair.roe.ac.uk