Lasair

The UK science platform for LSST

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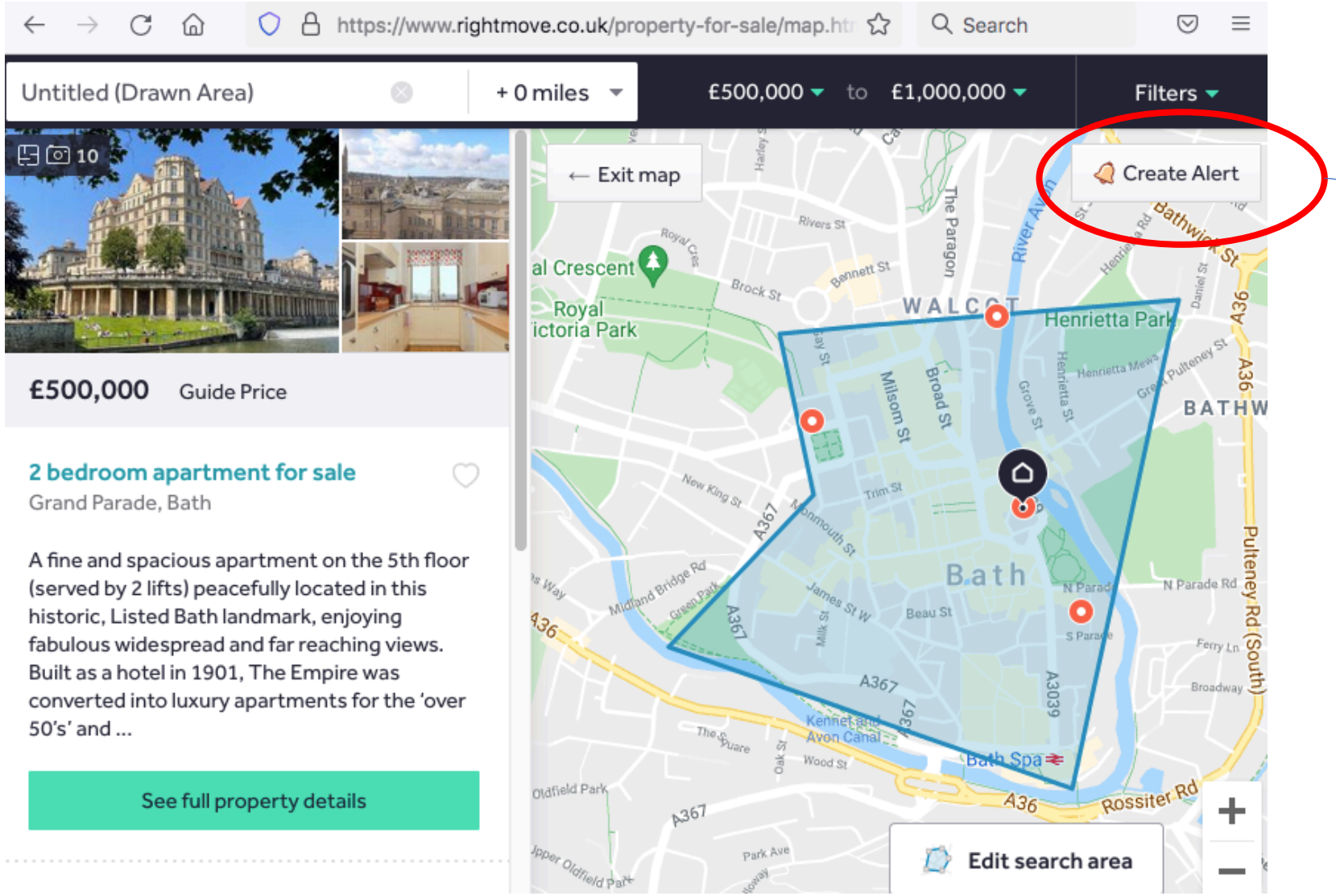
Time for Streaming Data (instead of running queries)



Want UK property?
rightmove.co.uk

Send email when a property satisfies my query

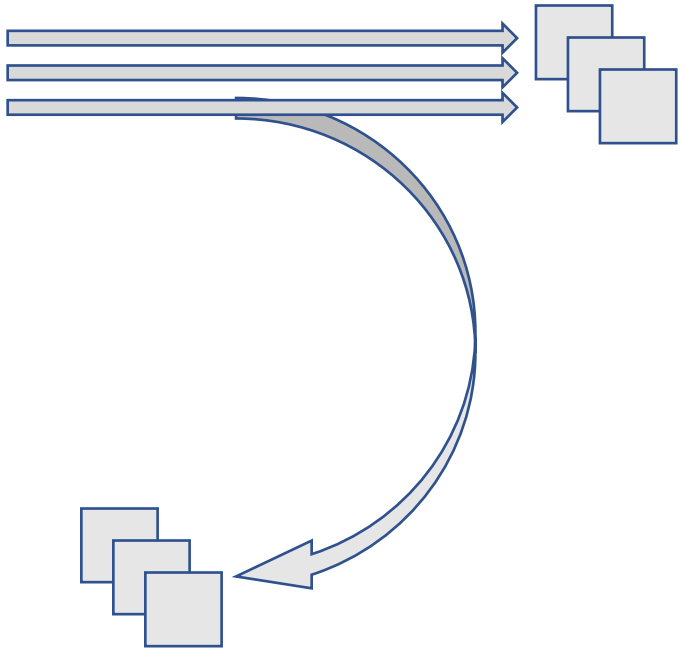
Lasair Concepts

CONTROL
- Web
- API
- Streams
- Notebook
- Mining
- Sharing

FILTER (*safe* SQL join)
- Lightcurve/features
- Crossmatch
- Watchlist
- Area & skymap
- Annotations

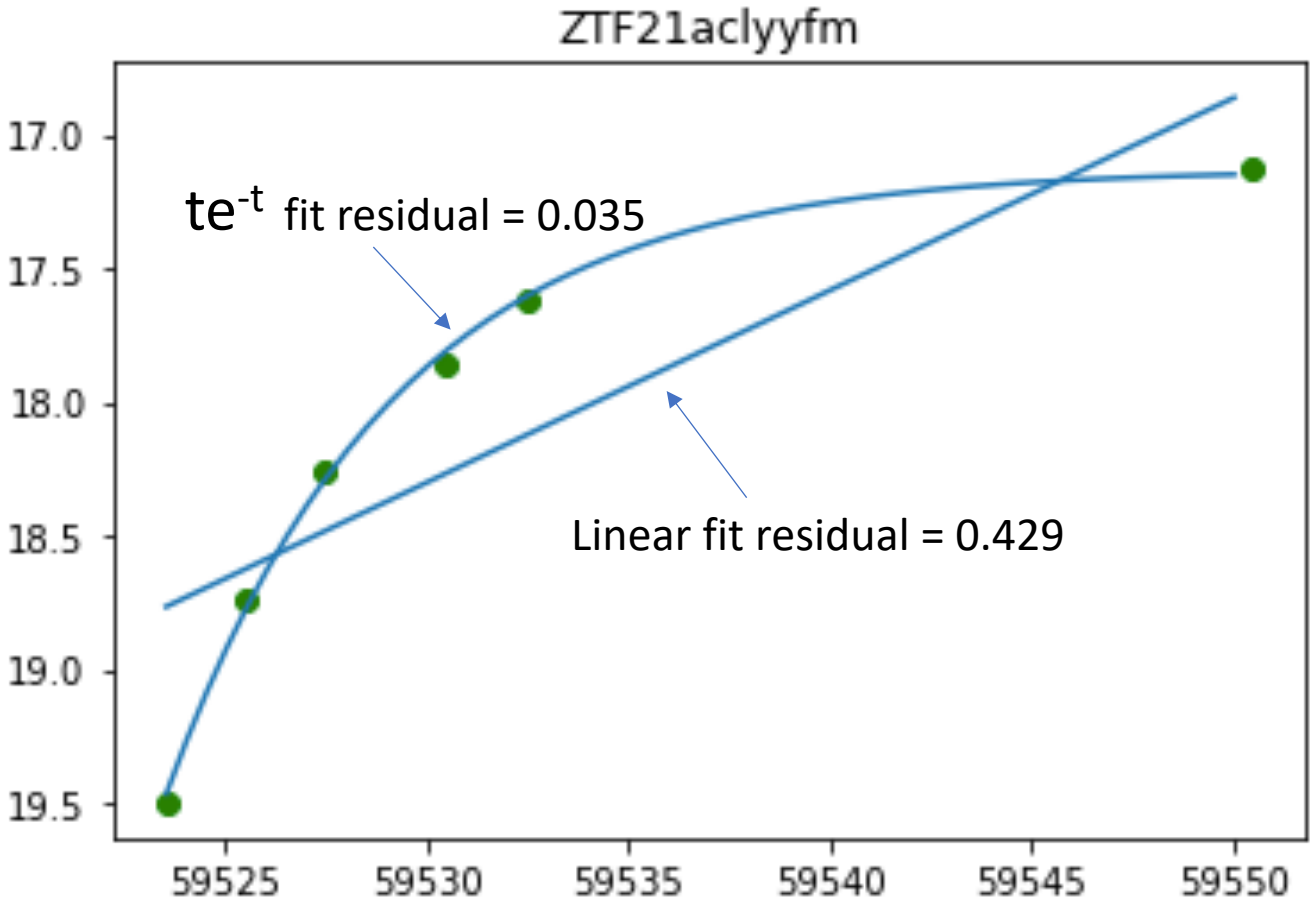
ANNOTATIONS
- Brokers (Alerce, Fink)
- Classifier code
- Transient Name Server
- Citizen science
- TiDES/4MOST

STREAMS
- kafka
- email



Lightcurve Features

Example:
curve fitting for rapidly emerging transients



Crossmatch

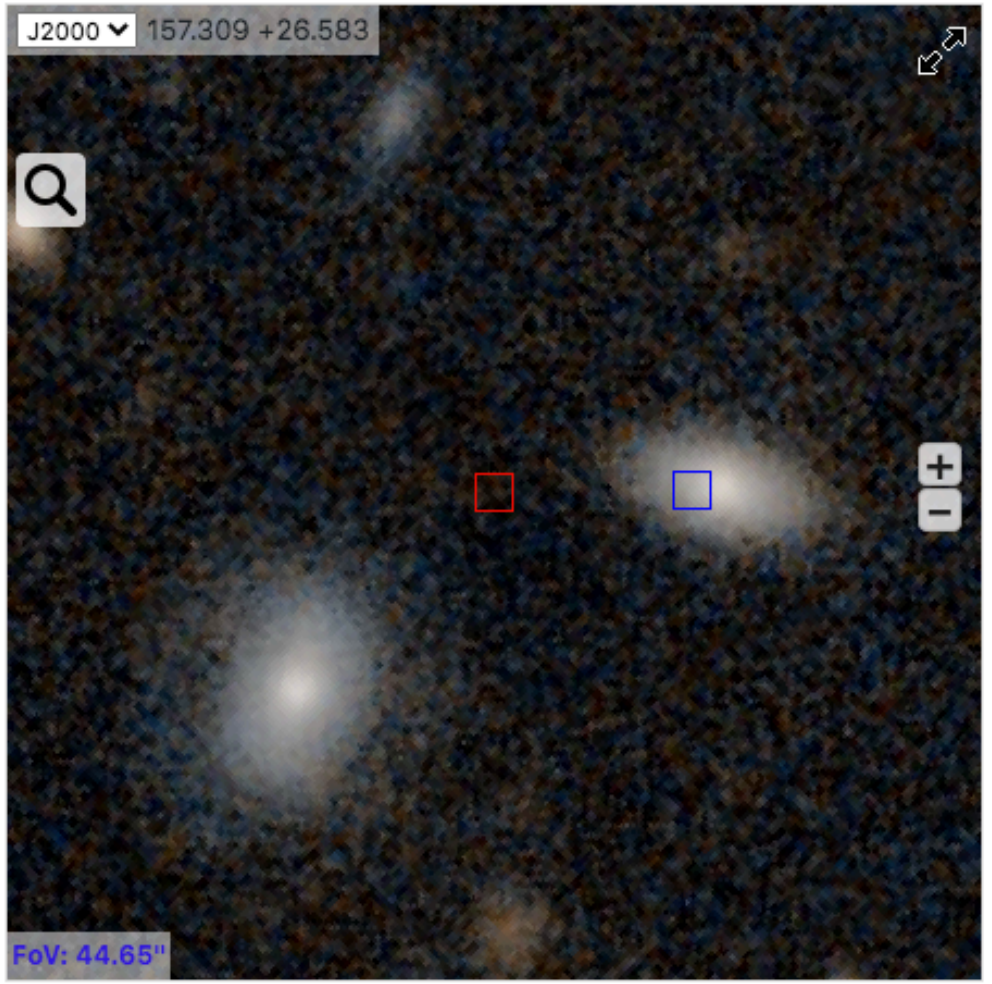
Sherlock

- Classified as SN, at 10.11 arcsec.
- Best crossmatch is galaxy
- The transient is possibly associated with *SDSS J102915.05+263508.6*; a J=15.28 mag galaxy found in the SDSS/2MASS/PS1 catalogues. Its located 0.02" S, 10.25" E from the galaxy centre.

TNS

- TNS name is AT 2021adpp
- discovered by ALeRCE
- discovery magnitude 20.8156

PanSTARRS



AladinLite

Watchlist example

Choose alerts from likely TDE galaxies
(Nichol and Arcavi)

Identifying Tidal Disruption Events via Prior Photometric Selection of Their Preferred Hosts

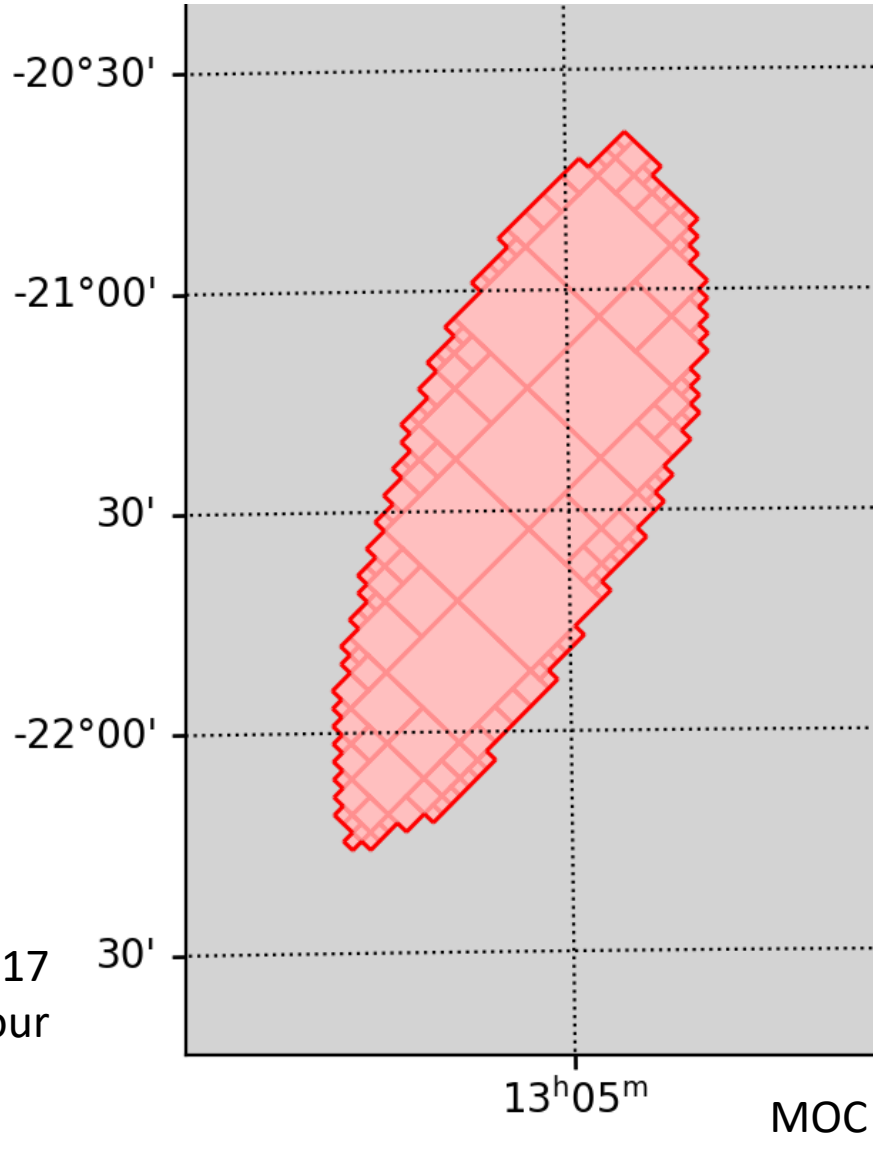
K. Decker French (Carnegie Observatories), Ann I. Zabludoff (University of Arizona)

A nuclear transient detected in a post-starburst galaxy or other quiescent galaxy with strong Balmer absorption is likely to be a Tidal Disruption Event (TDE). Identifying such

our technique, we present a new catalog of 67,484 candidate galaxies expected to have a high TDE rate, drawn from the SDSS, Pan-STARRS, DES, and WISE photometric surveys. This

Lasair Sky Area

- Upload a MOC
- Can make MOC from Healpix contours
- Events in the are are tagged

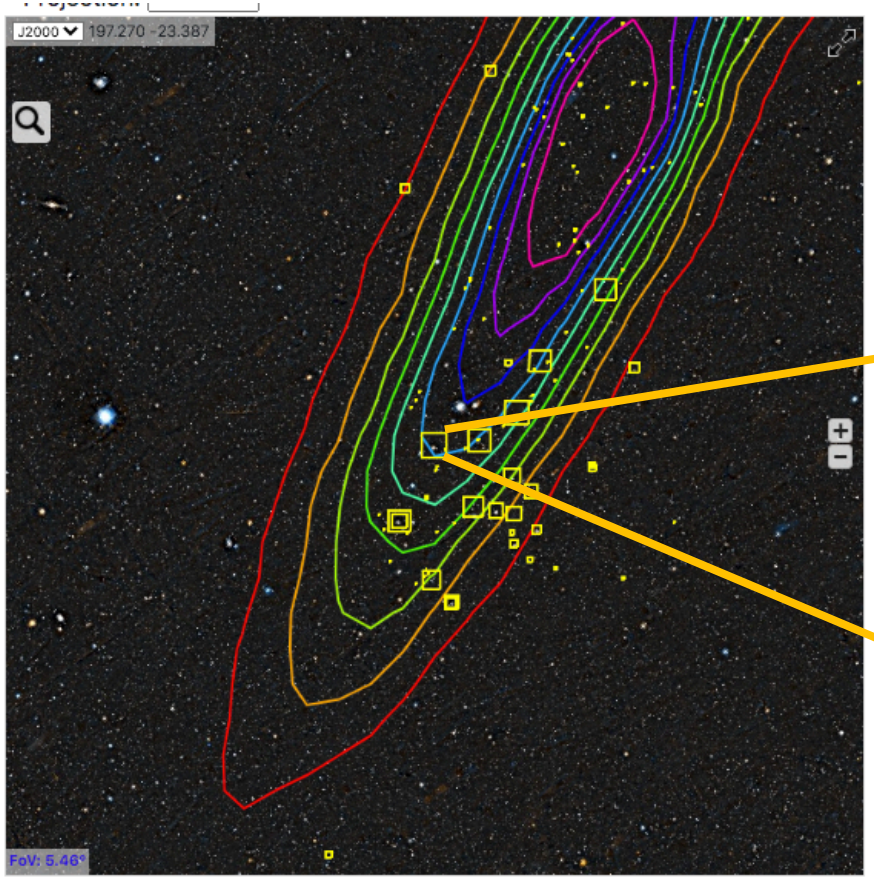


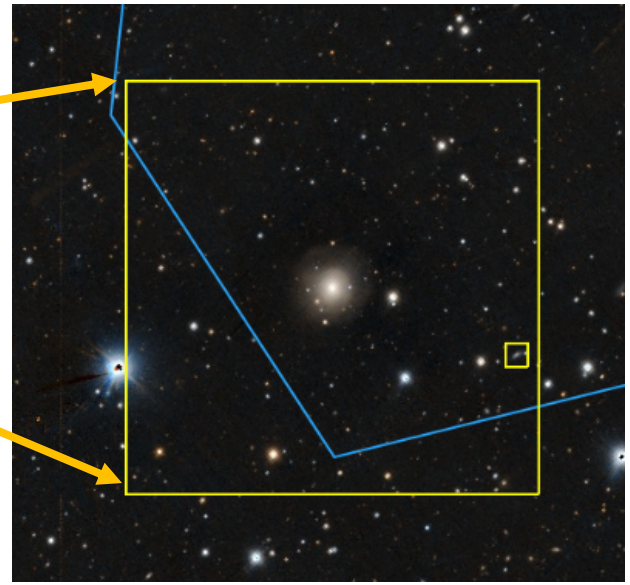
GW170817
10% inner contour

MOC

Skymaps

- area tag for 90% contour
- likely galaxies
- GW, neutrino, gamma, …





200 most probable galaxies

Name (NED link)	Percent probability	Distance (Mpc)
NGC4993	9.11	39.35
PGC803966	8.00	38.03
ESO508-014	7.15	43.15

GW170817

likelihood of nearby galaxies

Annotations

- Copy of Fink “early SN”
- Alerce classfications
- “Fastfinder” classifier

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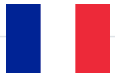
fink_early_sn

```
SELECT /*+ MAX_EXECUTION_TIME(300000) */ objects.objectId, fink_early_sn.timestamp,
fink_early_sn.classdict FROM objects, annotations AS fink_early_sn WHERE
objects.objectId=fink_early_sn.objectId AND fink_early_sn.topic="fink_early_sn" ORDER BY
fink_early_sn.timestamp DESC LIMIT 1000 OFFSET 0
```

Showing results 0-75



objectId	timestamp	classdict
ZTF21aclyyfm	Dec. 2, 2021, 2 p.m.	{"knscore": 0.13333333333333333, "rfcsore": 0.508, "snn_sn_vs_all": 0.21571730077266693, "snn_snia_vs_noni 0.7985661625862122}
ZTF21acljfzt	Dec. 2, 2021, 1 p.m.	{"knscore": 0, "rfcsore": 0.656, "snn_sn_vs_all": 0.32086366415023804, "snn_snia_vs_nonia": 0.8692888617515564}
ZTF21acojhgu	Dec. 2, 2021, 1 p.m.	{"knscore": 0, "rfcsore": 0.729, "snn_sn_vs_all": 0.03137245774269104, "snn_snia_vs_nonia":

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Fastfinder

```
SELECT /*+ MAX_EXECUTION_TIME(300000) */ objects.objectId, fastfinder.timestamp,
fastfinder.classdict FROM objects, annotations AS fastfinder WHERE
objects.objectId=fastfinder.objectId AND fastfinder.topic="fastfinder" ORDER BY
fastfinder.timestamp DESC LIMIT 1000 OFFSET 0
```

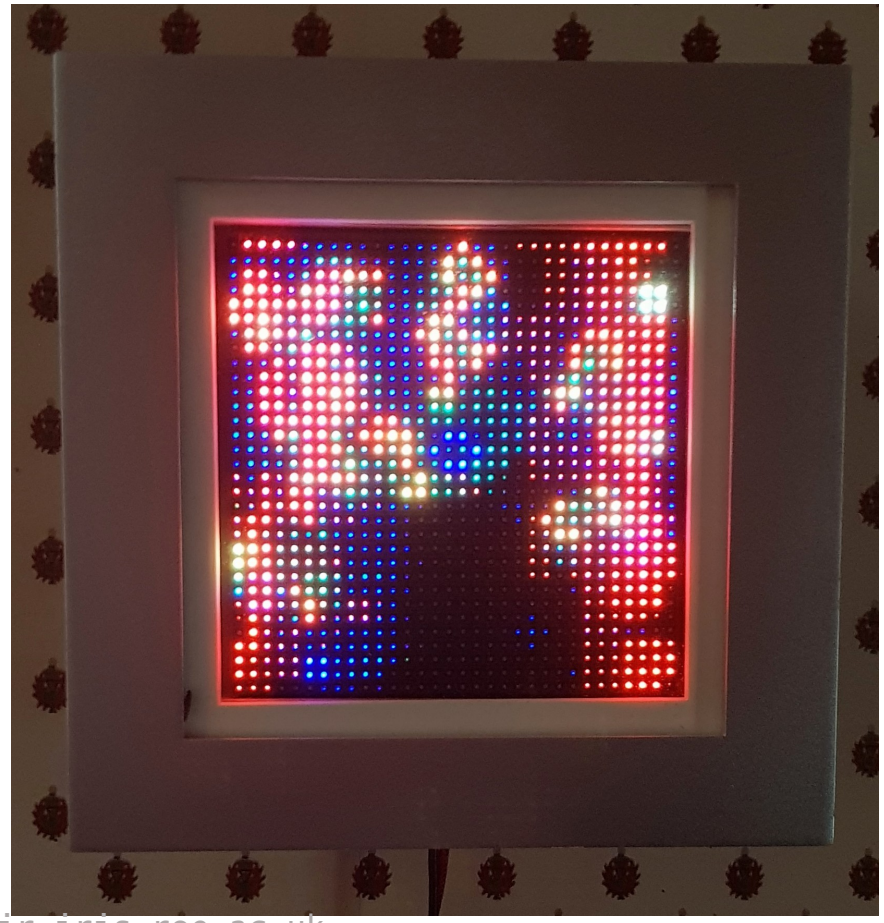
Showing results 0-194

objectId	timestamp	classdict
ZTF21acjzdhm	Nov. 5, 2021, 3:49 p.m.	{"KN score": 5, "ILT score": 0, "LBV score": 2, "LRN score": 3, "Nova score": 90, "Other score": 0, "US SN score": 0, "SNIa-x score": 0, "SB SNII-b score": 0, "Reliability Factor": 4}
ZTF21ackrkqq	Nov. 5, 2021, 3:49 p.m.	{"KN score": 5, "ILT score": 0, "LBV score": 2, "LRN score": 3, "Nova score": 90, "Other score": 0, "US SN score": 0, "SNIa-x score": 0, "SB SNII-b score": 0, "Reliability Factor": 2}
ZTF21aclhsxb	Nov. 5, 2021, 3:49 p.m.	{"KN score": 5, "ILT score": 0, "LBV score": 2, "LRN score": 3, "Nova score": 90, "Other score": 0, "US SN score": 0, "SNIa-x

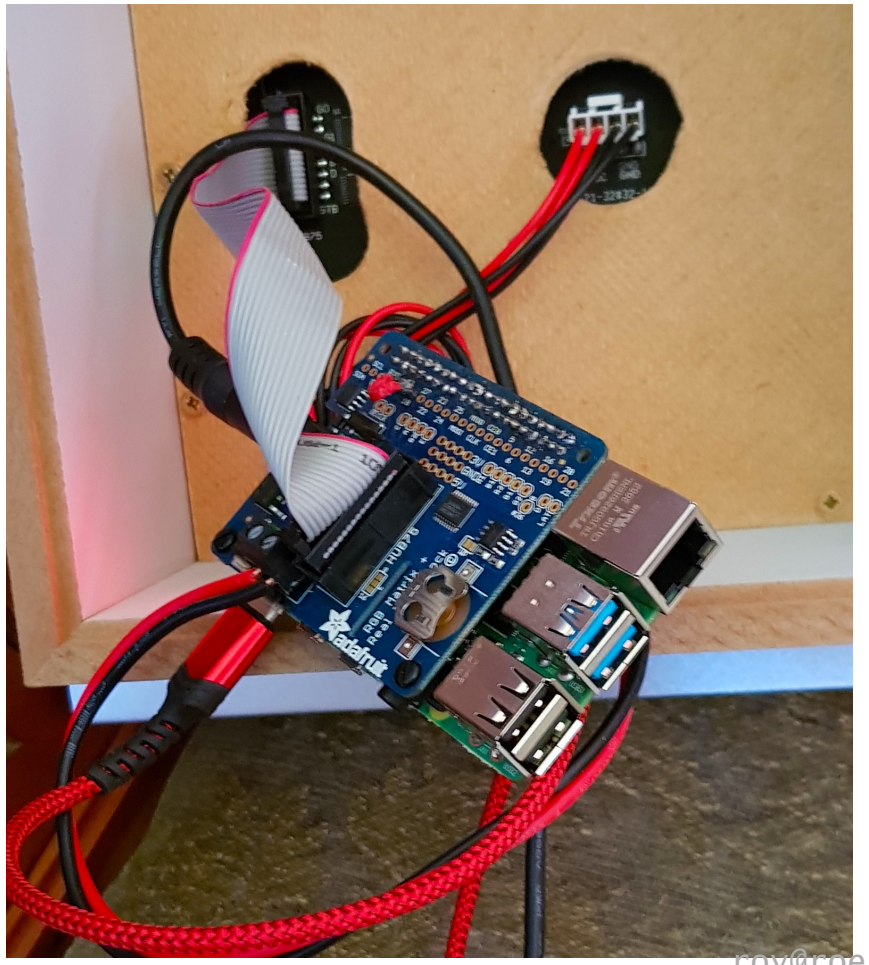
Wall-mounted alert monitor

Connect to
`kafka.lsst.ac.uk:9092`
using
`confluent_kafka`

32x32 LED array (Adafruit)



Raspberry Pi



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