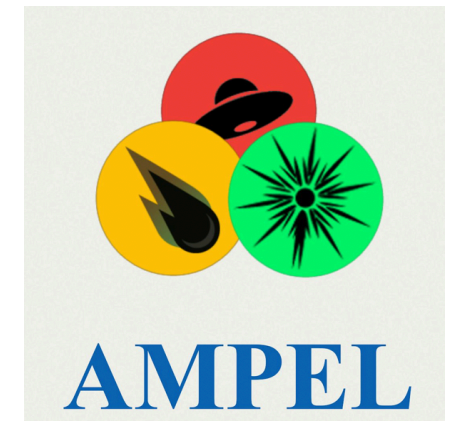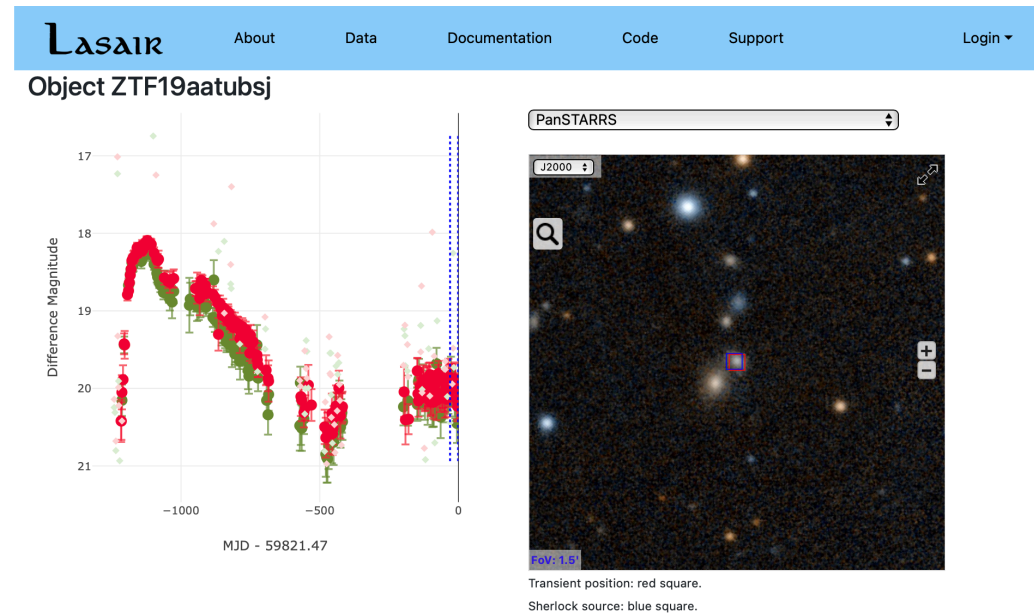# European Broker Services

The starting point

Three community brokers selected by Rubin/LSST:

- AMPEL (Kowalski, Nordin, van Santen, Germany)

- FINK (J. Peleton, E. Ishida, France)

- LASAIR (S. Smartt, K. Smith, R. Williams, UK)

Each broker has somewhat different focus with good interactions between teams. Years of experience with ATLAS and ZTF, supporting a large community

Project idea: Join forces and provide a coherent broker and realtime data analyses service for a large number of time-domaine observatories (e.g. ATLAS, Pan-STARRS, ZTF, ULTRASAT, LSST, IceCube, KM3NeT, LIGO/Virgo)

European Broker Services

Deliverables

UK node:

- Development of full access to the ATALS and Pan-STARRS transient streams -
- Enhancing Sherlock - crossmatching and classification

France node:
Development & deployment of a web-based platform for machine learning applications (training, testing, mining), and associated micro-services (versioning & comparison, connection to standardized and tailored data sets, automatic re-training, …).

German node:
- Provide optimal access to the ULTRASAT transient stream
- Support complex analyses workflows for multi-messenger data streams
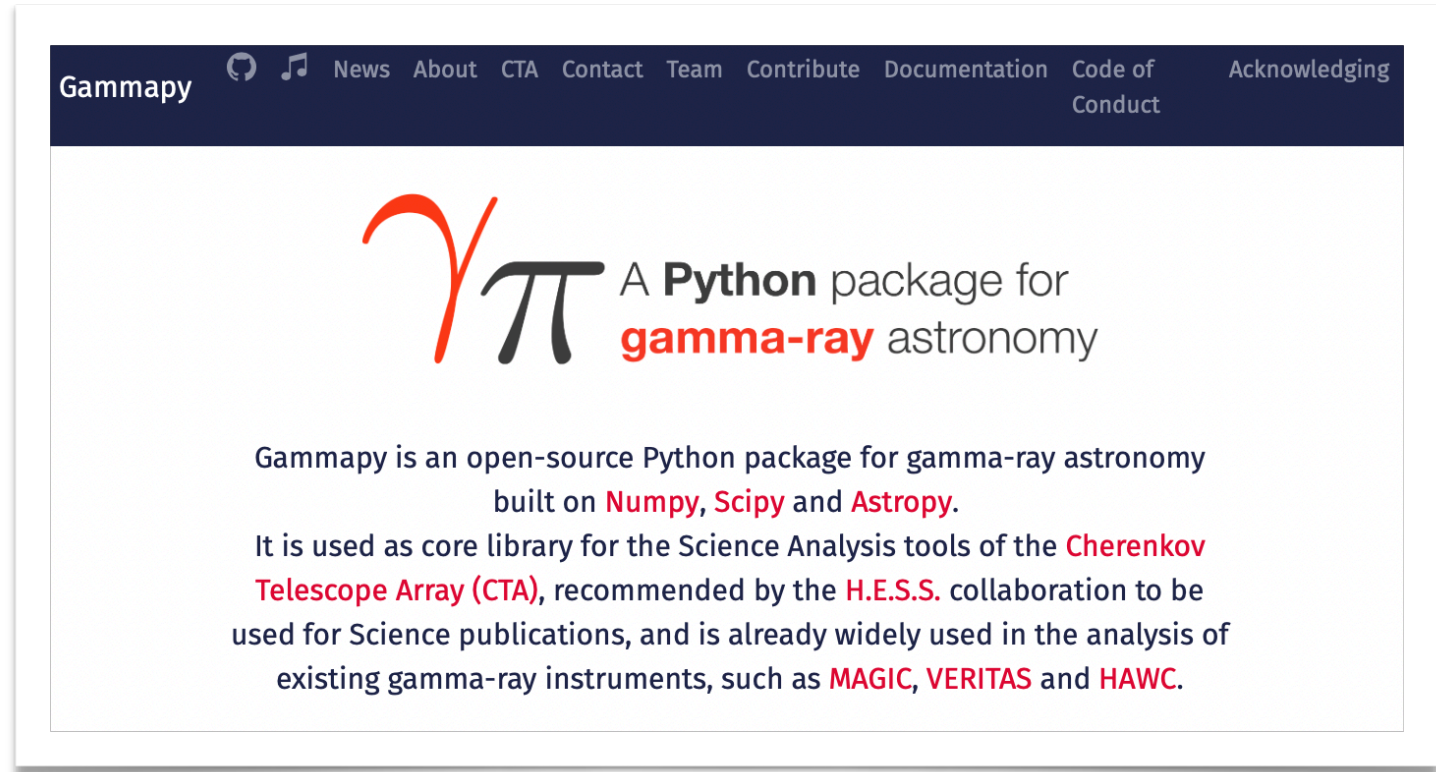
Common services:
- Develop kafka streams that all brokers can access; support data exchange with other efforts (e.g. AstroColibri)
- Maintain catalogs for crossmatching
- European repository for real time data: Distributed storage, and associated services, to host and serve historical broker data over the next decade to the community
- Provide access to Rubin/LSST data

Other ideas
Tools for joint analyses

GammaPy used by many to perform analysis of Air Cherenkov Telescope data.

We could expand it to allow analyses of X-rays or even high-energy neutrino and GW data. A joint analysis framework would facilitate new multimessenger work.