## Alert Management, Photometry and Evaluation of Lightcurves (AMPEL)

The broker landscape is confusing (and developing)

- ANTARES (and Alerce?) are brokers
  - Information added to alerts (eg catalog matching)
  - Users select a fraction of the stream to receive
  - Strong focus on ML classification
- Mars and Lasair are not quite brokers
  - A subset of the data is saved to a DB ("unstreamed")
  - Immediate, intuitive interface
- AMPEL can work as a broker...
  - ... it's really a framework for analysis of streamed data







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## AMPEL as a broker

- Tier 0: Select
  - $\circ$  alert props
  - $\circ$  catalogs
  - o ...
- Tier 3: Distribute
  - Slack, TNS, Marshal...





Why a streaming analysis framework (and what is that)?

- Once a stream always a stream
- Do full analysis while keeping the stream characteristic
  - Key definition is the state of a transient all data known by some user at some time
- Main design goals:
  - Provenance and reproducibility
  - Analysis flexibility
  - Allow versions of data and software
  - Alert rate







AMPEL, TNS & Marshal

- T0: Select transients w. rb>0.3, 2+ det, no Gaia matches
- T2: Match to more galaxies (eg. Milliquas)
- T3 Marshal: Save these to the AMPEL\_TNS program
  - Make sure everything we submit to the TNS should be available in the Marshal
- T3 TNS A: Submit new, extragalactic transients suitable for follow-up
  - Not already submitted by ZTF
  - Brighter than 19.5
  - Not older than 10 days
  - 2+ detections since the last significant non-detection
  - Further rejection using other star catalogs, esp for noisy Gaia matches
  - Continuous development
- T3 TNS B: Submit older, fainter candidates for completeness??



The AMPEL development environment

- Most users do not want to run the full AMPEL install
  - A lot more requirements for hosting a full DB
  - Realistic uses require either reading the live stream or a large alert archive, jobs more suited for a computer center
  - Most users wish to use catalog matching these are also large
- The development / sample repository
  - <u>https://github.com/AmpelProject/Ampel-contrib-sample</u>
  - Using the same abstract classes, definitions and shapers
  - Can develop code based on sample alerts
  - Once mature these can be integrated into a full AMPEL install
- Developers who needs to will get access to and can run AMPEL core locally