Exchanges: The Next Generation

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Today new transients are announced via the Transient Name Server (TNS), Astronomer’s Telegram, MPECs, through email, and through private systems (e.g. iPTF Marshal).

Need a system (today!) to consolidate all feeds.

**Features:**
- Define parameter space, e.g. “freshness,” absolute magnitude, percent increase, redshift, type, and sort or alert on those parameters.
- This could be separate software, and ANTARES can help, but it should be able to trigger hardware, so logically belongs with TOMs.
Feeds

You should be able to subscribe to feeds based on arbitrary discovery criteria for a transient but also anything else about a transient, e.g.:

Target X rebrightened.

Type of transient determined.

Swift observations were obtained.

The target has been scheduled for Gemini tonight.

A transient happened in galaxy X.

What you know about a target is just as important as the discovery itself!
Consolidated lists of resource availability, e.g.:

Keck HIRES is on days X, Y, Z

SDSS-V will be observing field X on this day.

These must be tailored to your interests. Need an API for sharing resource availability.
One TOM or many?

Do you have one follow-up system to serve all transient science?

**Advantages:**
- Write software once.
- One place for all observatories to sync with.
- Easy to use if you are interested in multiple types of transients
- When an object changes classifications, no extra steps are needed

**Disadvantages:**
- Different kinds of science have different needs
- Writing software in first place, and making changes require getting approval from all stakeholders.
Requirements for many-TOM solution

• Modular code
• Need code to build TOMs
• May need shared databases
• Hand-off objects if they change classification
• Standardization of APIs, protocols for posting / sharing data, controlling telescopes.
Discussion points

- Where does funding come from?
- Can we build an “Exchange Exchange” like Zooniverse?
- Are there tools from the social media universe we can use?
- How do we define APIs between diverse surveys, observatories?
- How can we roboticize more facilities and bring them into such a system? Where does that funding come from?
- How do other observatories build on the early scheduling work at LCO?