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Newsletter #122, April 9th 2020

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**ZTF Engineering Update (from Reed Riddle):**

The current international health crisis has affected operations at Palomar, mainly through the shutdown of the P200 telescope. ZTF and SEDM have been able to keep operating due to their robotic nature, but there have been some challenges. We lost most of March due to a very long string of bad weather, right before which we had another failure of the shutter (previously reported). We think that has been fixed, and ZTF was able to start operating again in early April. Then, on April 2nd, we had what we considered to be a worst case failure, where an NPS had a power drop out during a filter exchange, just as the R filter was being withdrawn from the filter closet. ROS flagged the problem, and operations were shut down for the night; during the next morning Jamey Eriksen, Mike Porter, and Reed Riddle sorted out the power issue (maybe a loose connection, so everything was wiggled and taped in place) and reset the filter system, as well as the guider and window heater that were taken offline. ZTF has observed, weather permitting, ever since without any issues.

Palomar operations are now severely restricted due to the state and county rules to shelter in place; as astronomy is considered non-essential (shocking!) the staff is no longer allowed to enter the domes to check the telescopes or turn the power on and set them up each day. On April 3rd, both the P48 and P60 were turned on and the domes evacuated and locked; we will operate until there is a hardware failure in the telescopes or ZTF/SEDM. At that point, a discussion will be held, but we don't know if anyone will be allowed to go into the domes to fix anything that goes wrong (very likely not for anything complicated or requiring multiple people). We are monitoring the systems closely to look for evidence of oncoming failures, but the reality is that ZTF and SEDM will run until something goes wrong, at which point it may well be parked until the health crisis ends and the quarantine is lifted for Palomar.

**Data Quality Working Group Update (from Roger Smith and Richard Dekany):**

Crosstalk reduction measures have been tested on sky during a brief period of good weather, confirming that crosstalk reduction is possible with slightly slower readout times. An intermediate trade between crosstalk and readout time, still meeting the 10 second read time requirement, will be tested before releasing the final fix.

Comparison of photometric error maps using filterless flats with those using standard flats with same LEDs for illumination are in the works. The goal is to eliminate the effect of strong internal reflections between CCD and filter which create an additive error in both dome and sky flats. Since quadrants are independently normalized to reference stars we are only concerned about variations within one quadrant. Internal reflection creates gradients at edges and corners of the CCDs between 0.2 and 0.5% per CCD quadrant. Errors exceed 1% at edges of CCDs since areas between CCDs do not reflect as strongly due to blackened surfaces and gaps. Currently the software for automated calibrations specifically prohibit filterless flats so until this constraint is removed, they must be acquired manually.

Maps of photometric error using PSF fitting show strong CCD-centric patterns (correlating with CCD thickness), which are not evident in aperture photometry. Some effort has been invested to harvest existing pipeline products to map high order PSF variation, but the results suggest that better tools are needed. Work continues.

**Invitation:** The Data Quality Working Group, which meets on Fridays at 8:30am PDT, welcomes volunteers willing to investigate data-driven aspects of photometric or astrometric precision, PSF spatial and temporal stability, image artifacts, or other factors pertaining to your science. Contact Roger Smith or Andrew Drake for teleconference information, and to join the effort.

**The Spring 2020 ZTF partnership meeting (Jakob Nordin):**

As a final note on the ZTF Berlin meeting, here is the collage of all people who sent in a photo! Also, don't forget, the meeting slides will continue to be available on the [Twiki](#).



## **News from working groups**

**AGNs and TDEs:** "We are looking into the rebrightening of our TDE Brienne (ZTF19aarioci) which been detected in the ZUDS stacked data as ZUDS20dpxam. The flux appears to be increasing then plateauing close to the limiting magnitude (20.4 magnitude in g-band and 20.8 in r-band)."

**Physics of supernovae and relativistic explosions:** "We discussed the impact of COVID-19 on our SN observing strategies. Although ZTF went back online only a few days before the telecon, the infant-SN group managed to detect a SN ZTF20aatzhhl in the TESS field within one day after the explosion. Remarkable about this SN is its detection at X-ray energies. It is not only one of the few SNe with an X-ray detection, but it is also the first infant SN with X-ray emission, and flash features! One of the possible sources of the X-ray photons is the interaction between the SN ejecta and the circumstellar material that gave rise to the flash features. If COVID-19 had not happened, ZTF20aatzhhl would have been a jackpot supernova. Despite the obstacles, the infant-SN group is trying to collect spectra and photometry of this unique event. If you have access to either a spectrograph or an imager, please contact [steve.schulze@weizmann.ac.il](mailto:steve.schulze@weizmann.ac.il)."

## **The papers corner:**

Please keep us updated about your submitted/published papers, they will be advertised here. Please send Joy Painter, the Astronomy Librarian at Caltech, links to papers as soon as they are published. They will be kept track of [here](#).

## **Reminders:**

- PublicAlerts: There is a [link](#) to the alerts archive on the [website](#)!
- Please help us keep track of all the available softwares! A preliminary list is available on the [twiki](#). Let us know if you are building a software which you think could benefit (or be relevant to) a large portion of the collaboration.
- **ZTF general slack channel:** Please join through this [link](#)!
- If you want to get access to the **ZTF data** via the IRSA interface, please request data access to the communication coordinators: [ztf.communication.coordinators@gmail.com](mailto:ztf.communication.coordinators@gmail.com)
- **Archive GUI** now ready! The interactive image search, filtering and visualization tool is now ready ().
- The **ZTF Twitter account** is now active! <https://twitter.com/ztfsurvey> Re-tweet @ztfsurvey!
- To use the **url shortener**(e.g. during telecons, talks, in emails), navigate to <http://zwicky.tf/shorten> (username: ztf password:16chips) and type in the URL you want shortened.

- The **Wiki page** is active! Check it out at <http://zwicky.tf/wiki>. To request access, please email us at [ZTF.communication.coordinators@gmail.com](mailto:ZTF.communication coordinators@gmail.com)

*“Science is the organized skepticism in the reliability of expert opinion”*

Richard Feynman

Have a great and productive week!

Igor and Erik