##################

Newsletter #152 January 13th 2021

##################

If the newsletter does not look good in your email, check the pdf here!

ROS Contest Winners (Reed)

The winter observing contest is over, and shows some interesting differences from last year. The ZTF overhead has increased about 1.5s over last winter, due to some adjustments in the operation of the system. ZTF also did extended exposures (over 30s) on every night, instead of about half of the nights last year. And, we did three times the number of filter exchanges per night, including two nights with more than 20 exchanges per night. Overall we took more observations, but we also had much better weather. ROS itself was more stable, with almost no software resets while it corrected issues and kept chugging along.

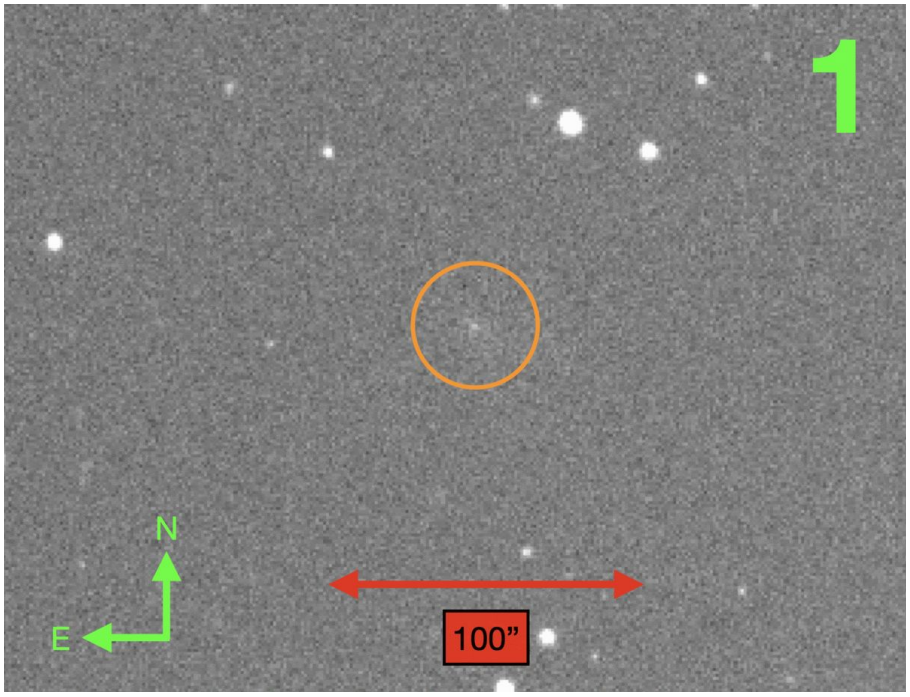
All of this shows that ZTF has matured as an instrument, with a lot of different science programs going on and the flexibility to work through problems and keep the science flowing.

Now, for the contest winners…for the minimum observations the winner is **Roger Smith**, who had the largest minimum guess of 70 while the system did 121 on one night. And, for the maximum guess, the system did 1000 observations and **Jesper Sollerman** guessed 1000 observations. Yes, he got it exactly right! Congratulations to the winners.

News from working groups

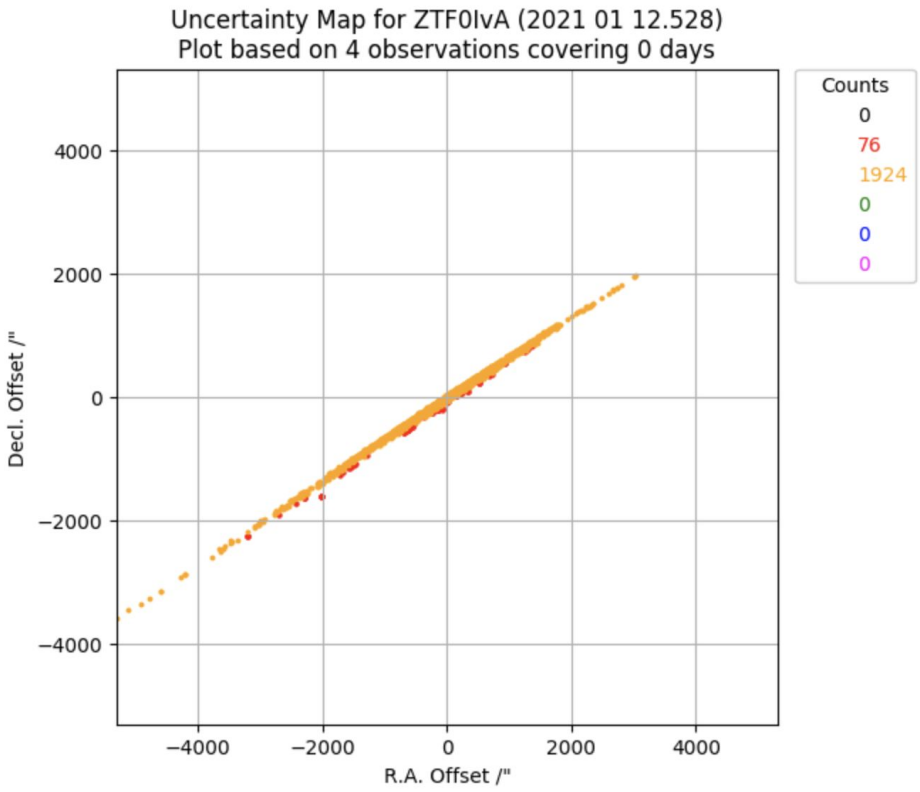
Solar System:

“ZTF made the first recovery observations of previously lost near-Sun comet P/2016 J3 (STEREO). The comet which was previously discovered by the Sun-staring spacecraft STEREO. The comet was detected in 5 ZTF images taken during the evening Twilight Survey on 2020 January 5 UTC using a combination of human vetting and our deep learning comet recognizing software Tails. The recovery images are presented below in a gif.



The comet has a clearly extended appearance with a coma ~20" wide in these images and two tails, one ion tail pointing to the NE and an anti-tail pointing SW. The ZTF observations drastically redefined the orbit of the comet which now has a perihelion distance of 0.5 au, well within the orbit of the Earth. The comet was detected by ZTF in the evening Twilight survey as the comet approached its perihelion passage which is on 2020 Jan 25 UTC according to the new ZTF-enable orbit. We expect future detection of near-Sun comets thanks to the Twilight survey's small Solar elongation pointing geometry and our Tails comet recognition software.

Thanks to our ZSTREAK detection pipeline, we discovered four new NEOs in the last week: 2021 AV = ZTF0Inv (Jan. 5.95 UT), 2021 AS1 = ZTF0Io1 (Jan. 6.94 UT) , 2021 AM2 = ZTF0IqG (Jan. 8.54 UT), 2021 AS3 = ZTF0Is6 (Jan. 10.56 UT). The discoveries were heavily aided by rapid-response ToO self-follow up by ZTF which thanks to its large field of view was able to quickly recover the objects soon after their initial discovery observations. The positional sky-plane uncertainty of the objects can be very large, more than a degree across even just hours after the initial observations making the of these fast-moving objects difficult or impossible for most follow-up facilities as seen below for a recently observed fast-moving NEO example.”



Cosmology with SNe Ia:

“We have been working on follow-up observations of ZTF20acynjjo with LCO and NOT. At z = 0.0151, this SN is at an ideal distance for observations of Cepheids/tip of the red giant branch stars to calibrate the luminosity and measure the Hubble constant.”

Machine Learning:

“After a slowdown over the new years, the variability project - scope - has restarted. One of the things we are doing is to move to continuous integration, starting with building notebooks for a field guide and golden samples for the different classifiers (Dima, Jan, ..). A fraction of wrong periods are being investigated (e.g. EBs - Matthew G). Work on a few papers continues (High amplitude variables - Michael C, pulsars - Amruta, ...). SN Ia classifier is in production and the corresponding paper near completion, and there has been progress in the Non-Ia classifier.”

Physics of supernovae and relativistic explosions:

“Dan gave a summary of the AT2018cow-like transient AT2020xnd. Yuhan and Anna have improved the fast-transient pipeline to search for these rare transients in real-time. AT2020xnd is the most promising candidate. In fact, it shares many similarities with AT2018cow: short rise-time, blue colour, barely any features in the spectrum. Dan is finishing a quick discovery paper. Anna will lead a detailed multi-wavelength paper that will also include radio and X-ray data.“

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
- 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

"The snow doesn't give a soft white damn whom it touches."
- e e cummings

Have a good and productive week!!

Erik and Igor