

Carpe Noctem



The News of Central Texas Astronomical Society

January, February, March 2020

President: Dick Campbell

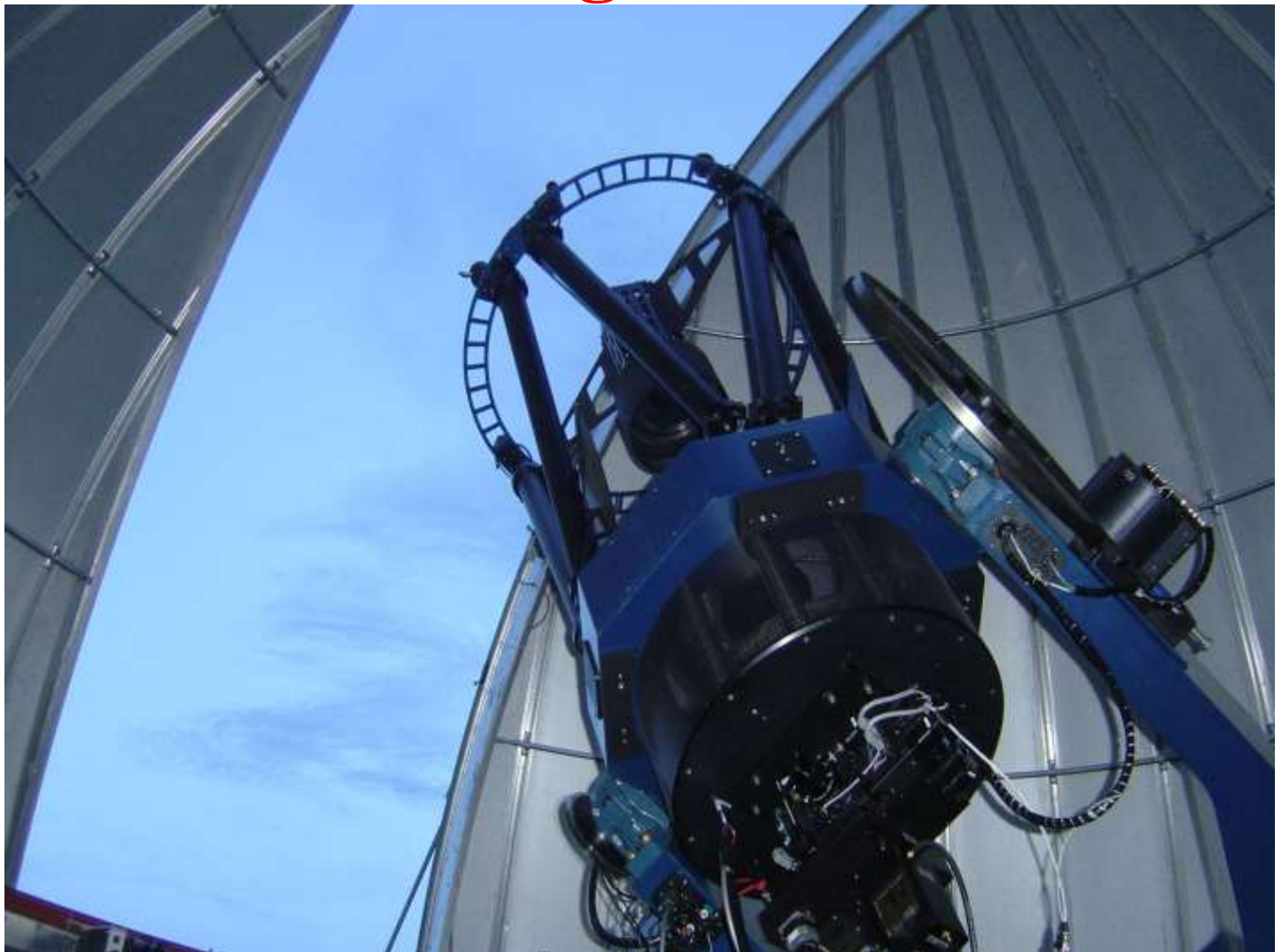
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VOLUME XXVI, NUMBER 5

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Moving forward



Despite adversity

CTAS Members and Friends;

After considering our observatory environment and that we can't control the public attendees, the CTAS Board of Directors has voted to suspend all public star parties and activities until further notice. This action primarily affects the Third Saturday Star Parties and Open House. Also, we will not accept any group events.

Member events will continue as scheduled. Please check the Calendar of Events for cancellations. Members participating in meetings or observatory activities are asked to observe sanitary protocols, and avoid attending any event if they feel ill, or believe they may have been exposed. Consider that we have many members who are in "at-risk" groups.

We have updated public notices on our website and Calendar of Events.

Thank you for your patience and understanding!

Observatory training

If you are interested in receiving training on the Meyer Observatory 24-inch telescope, join one of our ongoing training classes!

To sign up for training, please send Dick Campbell (Dick_Campbell@baylor.edu) this information:

1. Contact info (email, cell phone number with text capability)
2. Previous experience with PJMO, if any (not required)
3. Availability (weekdays only MTWR, weekends only FSS, or flexible). All sessions will be conducted in the evening.

If you are inexperienced, please don't feel hesitant to sign up. The system is relatively easy to operate, and it will be a great learning experience for you.

Responses will be accepted continually, and scheduling will be based on the availability of the responders.

April Meeting Pluto Program

On April 21st, David Bergman from the FWAS will join us for this very topical program.

On July 14, 2015 NASA's New Horizons probe travelled through the Pluto system at nearly 31,000 mph. As data streamed back over the following weeks, it quickly became apparent the mission was a great success. Images and instrument data revealed a variety of complex terrain that was only hinted at by our distant observations. No longer just a circular smudge of pixels in even the best of Hubble images, Pluto had become its own distinct world.

In this presentation we will not only enjoy many of the best images captured by New Horizons, but we will explore how Pluto's highly elliptical orbit and the extreme tilt of its axis of rotation influence surface temperature and atmospheric pressure to create such interesting terrain. We will also look at some of the battles involved in getting the nearly one billion dollar mission to the launch pad and the perils of exploring the outer Solar system.

In mythology, Pluto was gatekeeper to the underworld. In the modern world, New Horizons has brought Pluto to life as gatekeeper of the Kuiper Belt.

The land of the ice dwarves beckons!

Purkinje effect

The human eye in scotopic vision (during the night) is more sensitive to the blue end of the spectrum compared to the red end. This can be important dealing with red stars, even in the case of brilliant Betelgeuse. For Betelgeuse, and for my 50-year-old eyes, I do not consider induced variations of magnitude, except the aforementioned effects at the beginning of the last observational years with the star low East before dusk.

Visual observers need to be aware of the Purkinje effect and use the quick-glance method to make their observations. Do not stare at alf Ori or the comparison stars, as doing so may make them become artificially bright (Elizabeth O. Waagen AAVSO alert notice 690 (2020)).

More light!

Amateur astronomers are no friends of the full moon. Its light drowns out (diminishes the contrast of) deep sky objects. The absence of shadow on the moon's surface at that time obscures most lunar objects except rays of ejecta. Dark skies without this interference are, however, available for all but about one week of a given month.

A lunation defines the 29 1/2-day period from one new moon to the next. In the first half of a lunation, the moon grows (waxes) from a thin crescent to full. It is already up when the sun goes down, setting initially in early evening and, as the days progress, at increasingly later hours during the night. The skies remain dark in the subsequent hours between moonset and sunrise. Thus, if the amateur is willing to do his observing in the wee hours, he can still have darkness at, say, 3 a.m. The rising of the full moon coincides with sunset and its setting with sunrise - no luck here! But in succeeding days, an increasing window of dark skies opens now in early evening, after sunset and before the moon rises at later and later times. Morning hours are moonless in the first half of a lunation and evening hours in the latter half (mnemonic, ME).

Another factor that can drown out faint objects is the presence of twilight. Twilight, including its faintest form ("astronomical twilight"), is present when the sun is up to 18 degrees below the horizon. The sun appears to move across the sky at fifteen degrees per hour. Latitude and season affect the timing, but generally speaking twilight of some degree is therefore present about one hour before sunrise and for one hour after sunset. This means that the two days before and after full moon, while having brief periods of darkness, are still affected by twilight during that darkness. Three weeks - all but the two days before full moon, the day of full moon and the two days thereafter - in each month remain when the amateur astronomer can have the darkness necessary for good observing.

P.S. Goethe's last words: "Light! More light!"
- Eric Rachut

Presidents Letter – March 2020

Greetings Astronomers - I hope you will be able to join us at the April meeting at the IHOP in Waco. We will have a wonderful program on the Pluto Horizons Mission and a time for fellowship and talking astronomy. Bring the whole family! Unless public health concerns impinge upon our April meetings, we plan to hold those meetings as scheduled.

We continue to make updates to the observatory, and we have started operator training. If you have not joined a class, you can still come out and learn how to run the telescope – See Observatory training above. We will continue our monthly Open House and Member Star Parties in the future. In addition, several private groups that make contributions will be touring the observatory as health conditions allow. Science projects continue with the Habitable Exoplanet Survey and basic eyepiece observing. We have great dark skies at the Turner Research Station. As we move into the spring season, I hope you will be able to take advantage of them!

I also want to remind all members that we have monthly Board Meetings (announced on the website Calendar of Events), and all members are welcome to attend. I look forward to seeing you at

a Star Party!

- Dick Campbell
President, CTAS

Upcoming CTAS Events

All events are shown on the Calendar of Events on our [website](#). In the event of discrepancies, the web Calendar of Events is the official schedule, as changes may occur throughout the year.

| New Moon | Member Star Party | Meetings | Open House |
|----------|----------------------|-----------|---------------|
| 3/24/20 | Canceled | Canceled* | Canceled |
| 4/22/20 | 4/25/20 | 4/21/20 | 4/18/20 |
| 5/22/20 | 5/23/20 | 5/19/20 | 5/16/20 |
| 6/21/20 | 6/13/20 | 6/16/20* | 6/20/20 |
| 7/20/20 | 7/25/20 | 7/25/20** | 7/18/20 |

*General Business Meeting

**Star-B-Que and General Meeting

New Members

Nata Boone
Jon Depinet
Shari Hariss
Linda Pate
Amanda Strickland

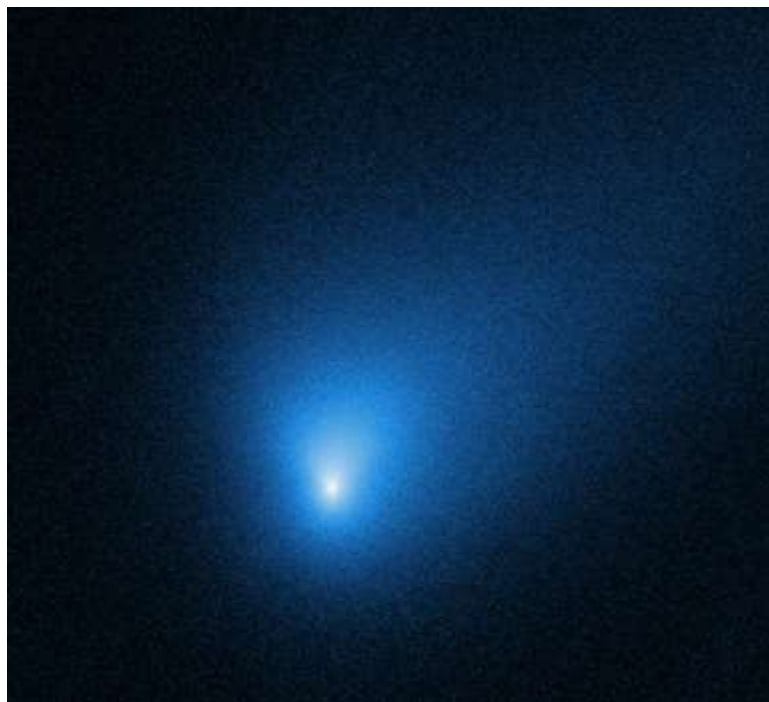
We welcome you aboard the Starship CTAS!

Tiny Comet Makes Big News

It's not very often that a newly discovered comet gets the entire astronomy community excited. However, this time it's not for the reasons you might think. There will be no near Earth passing, and no spectacular tail stretching across the evening sky. It's where this comet came from that has everyone in a buzz.

On the night of August 30th, 2019, a Russian amateur astronomer in Crimea, Gennady Borisov, reported the discovery of a 17th magnitude comet. And, as with all comet discoveries, the comet was named after the discoverer, and designated: C/2019 Q4 Borisov, C/ for being a long period comet, 2019 for the year, Q4 for being the 4th comet discovered during the last half of August, and Borisov after the discoverer. It was just a few days later, after the

orbital data was calculated, that it was revealed that it was highly hyperbolic, which took it far beyond the limits of our solar system. It actually plotted out towards the binary star system of Kruger 60, which sits 13 million light-years from Earth. As a result, the name was revised to 2I/Borisov, which designates it as the second interstellar object to ever be discovered. The first interstellar object was 1I/Oumuamua, an asteroid that was discovered in 2017 by a group of Hawaiians. Oumuamua was then thought to possibly be a comet, but that was later discounted because it didn't display any comet attributes such as a coma or tail.



However, 2I/Borisov is definitely a comet. A coma and short stubby tail were immediately observed by the Hubble Telescope, as shown in this image taken in early October. In addition, spectra evidence showed evidence of water, a major ingredient in all comets. That's why this tiny comet, with a core of only 1 kilometer, has gained the undivided attention of many professional observatories, including scores of amateurs.

Being a comet enthusiast, I decided to join in on the watch party. The challenge of trying to image such a rare object was just too much to resist. It would take near perfect conditions to have a chance at

imaging a 15 or 16th magnitude object. And then, after a Halloween cold front, the skies cleared and everything seemed to fall into place. At 5 am on the morning of Nov. 1, I ventured out into the subfreezing predawn air to give it a try.



The comet is traveling at over 100,000 MPH, which limits any long exposures unless you can track on a faint comet.

This image was made with just a single 60 second exposure taken with a Canon T4i pushed to its maximum of 12,800 iso and coupled with my 12.5" Newt. telescope. The field of view is 12.5x16.5 min. Estimates at this time had the comet at 15.7 mag.

On Dec. 8th, the comet was going to be at perihelion, with predicted estimates of 14.7 mag. But long-range weather predictions weren't very good, and the moon was going to interfere. So, on the morning of Dec. 3rd, I took advantage of another clear early morning clear sky.



This image is a combination of 5-75 sec. exposures stacked on the comet. The comet appeared close to its estimated mag. of 14.7, and a short fan tail can be faintly seen in this imaged (cropped to an 8x10 min. FOV).

Dec. 28th marked the comet's closest point to Earth, and predictions had the comet at its brightest. The weather delayed any imaging until the morning of Dec. 31st. I was expecting to see a brighter comet, but to my surprise (and disappointment), the comet appeared much dimmer and smaller. Reports had it fading after perihelion, and it was barely detectable in this 60 second exposure taken at 12,800 iso. The magnitude is very close to that of a nearby 16.5 magnitude star. (8x10 min. FOV)



Despite the fact that this is not a very impressive-looking comet, I kind of feel like the fisherman who landed the big one with a low-test line Pocket-Fisherman.

Plus, I feel really fortunate to have had the opportunity to record this alien visitor before it leaves our skies for the southern hemisphere, and heads out "To infinity and beyond", to never return again.

- Johnny Barton

Nearby galaxy



Here is a nice Galaxy (IC342) that is about 8 million light years from us. What you are seeing is the view directly through our Milky Way. If it was situated so that it was directly visible without going through the gas and dust of the Milky Way, we could see it with our naked eye. This was shot on December 18th, 2019, from my observatory with about 3 hours of total exposure. This is a Spiral Galaxy about the same size of our galaxy, and is part of our "local group" of galaxies. This was captured with an Astro-Tech Carbon Fiber Armed 10 Inch RC telescope and an SBIG STT 8300M with Baader LRGB filters.

- Aubrey Brickhouse

Possible bright comet

I just wanted to give everyone a heads-up on a possible bright comet in our future. Comet C/2019 Y4 ATLAS was discovered by the Asteroid Terrestrial-Impact Last Alert System research team on Dec. 28, 2019. It was 19.6 magnitude at that time, but has brightened to between 12-12.5 magnitude as of this week. I managed to capture a few 60-second images last night as the comet is making its way thru the dipper of Ursa Major. The comet is rather small because of being out beyond the orbit of Mars, but is rapidly approaching a close (.25 AU) perihelion date with the sun on May 30. What has astronomers excited is that this comet is on the exact orbital track of the Great Comet C/1844 Y1 of 1844-45, which was visible during

daylight with a spectacular tail. They think this comet might be a parcel or partner of that comet. Latest estimates are predicting 3 magnitude at perihelion and 6 magnitude in early May, but it has already exceeded predictions. The comet will be difficult to view in late May because of the sun's glare, but we might get a good show the week before.

Anyway, this one deserves a close watch because of its potential to be something really neat in our evening sky.

- Johnny Barton

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