Carpe Noctem

The News of Central Texas Astronomical Society

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Making Every Pixel Count

By: Aubrey Brickhouse

I have a DVD from Adam Block "Making Every Pixel Count" for Powerful Processing in Photoshop that I am making available by donating it to CTAS. It can be checked out a month at a time. If you want to learn how to post-process your astronomy images, this is a great DVD. I will bring it to the June Club Meeting so you can check it out. Adam Block has 24 Video Lessons that you can use to help you understand and perform some really neat tricks.

Fire Break!

The Turnersville Fire Department visited last month and recommended we increase the fire break area around our buildings due to the extreme fire hazard this summer. Next time you visit, you will notice larger cleared areas, and more room for parking. Thanks to Dean Chandler for getting Brent, our dozer guy, out to PJMO to do the work in a timely manner.

View of Turner Reseach Station with the expanded fire break.

One Oddball Among 12 Newfound Moons Discovered Orbiting Jupiter

By Space.com

While hunting for the proposed Planet Nine, a massive planet that some believe could lie beyond Pluto, a team of scientists, led by Scott Sheppard from the Carnegie Institution for Science, found the 12 moons orbiting Jupiter. With this discovery, Jupiter now has a staggering 79 known orbiting moons — more than any other planet in the solar system.

In the spring of 2017, these researchers were searching for Planet Nine in the region past Pluto, and "Jupiter just happened to be in the sky near the search fields where we were looking," Sheppard said. This gave the team a unique opportunity to search for new moons around Jupiter in addition to objects located past Pluto, according to the statement.

Nine of the newly discovered moons have retrograde orbits meaning that they orbit in the opposite direction of the planet's spin. These satellites are part of a large group of moons that orbit in retrograde far from Jupiter. In fact, of Jupiter's 67 previously discovered moons, the 33 outermost moons all have retrograde orbits.

Two of the newly discovered moons orbit much closer to Jupiter and have a prograde orbit, meaning that they orbit in the same direction as the planet. These are part of a group of prograde moons that orbit closer to Jupiter than the retrograde moons do. Most of these prograde moons take less than a year to travel around the planet.

The newly discovered "oddball" moon has a prograde orbit, but it orbits farther from Jupiter than the other moons in the larger prograde group and it takes about one and a half Earth years to complete an orbit. The satellite's oddness comes from its tiny size and the fact that, although it's out in the realm of the retrograde moons, it's orbiting in the opposite direction to them. Researchers have proposed naming the "oddball" Valetudo, after the Roman goddess of health and hygiene.

Valetudo is more than just the odd moon out; it's also a serious collision hazard.

Because it's orbiting in the opposite direction of the nine "new" retrograde moons, and across their paths, there is a high risk that it will hit one of them, according to the statement.

President's Letter – July 2018

Greetings CTASers! Hope everyone is finding a way to stay cool. We had a great turnout at the July Star-B-Q, and I enjoyed meeting some new faces. I was very encouraging to see all the scopes set up on the observing field. After some bouts of bad luck with various systems at the observatory, I am happy to report that the Meyer Observatory is up and running 100% including remotely. There are a bunch of folks to thanks for their tireless efforts in fixing the hydraulics, the air conditioning, the computers, and on and on. We even got the new weather station installed and reporting. As a volunteer organization, we could not survive without this support, and we are truly blessed to have some great members volunteering.

We recently completed some data collection for the Whole Earth Telescope (WET) in July, and there are some interesting events coming up in August. There will be an occultation of a star by Pluto, and we are going to try something new - a sidewalk star party in downtown Waco. You will be getting details about these and other events by separate announcements.

Finally, you may not be aware that we conducted two private paid events. These events not only help our bottom line, they help CTAS promote astronomy. Hope to see you on the observing fields.

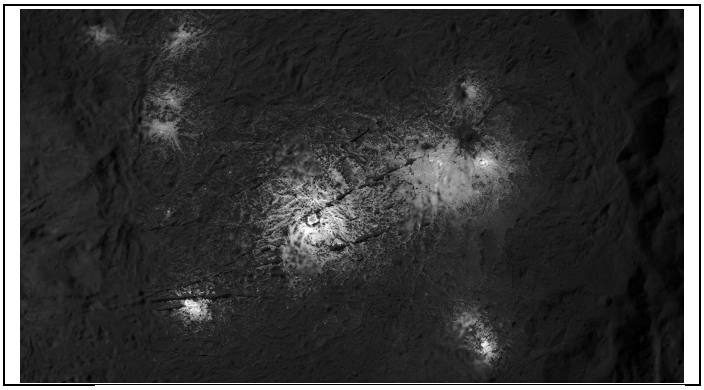
Clear Skies!

Dick Campbell

Dwarf Planet Ceres' Bizarre Bright Spots Shine in Stunning Up-Close View

By: Space.com

NASA'sCeres-orbiting Dawn Spacecraft has captured new photos of several of the bright-white features, formally known as faculae, that lie at the bottom of the dwarf planet's 57-mile-wide (92 kilometers) Occator Crater.



Dawn snapped the images from an elevation of about 21 miles (34 km). The probe's observations revealed that the bright spots are salty deposits, composed primarily of sodium carbonate and ammonium chloride. Scientists think this material was left behind when briny water boiled away into space, but they're not sure where, exactly, those brines came from — specifically, how deep underground the reservoirs were.

"The new images of Occator Crater and the surrounding areas have exceeded expectations, revealing beautiful, alien landscapes," Dawn principal investigator Carol Raymond, of NASA's Jet Propulsion Laboratory.

CTAS Star Party for Dean Highland Elementary in Waco

By: Johnny Barton

At the request of a kindergarten teacher at Dean Highland Elementary School in Waco, CTAS members, Johnny Barton and Dave Eisfeldt, participated in their Space Night activities. The school wanted to keep it as an early evening event on a Friday night from 6:30 to 8 pm. So, we planned the viewing on April 20 in order to catch the Moon just three days from first quarter phase, and to look at the Sun just before it set.

Just before the viewing started the students from Pre-K thru 2nd Grade and their families all gathered in the cafeteria to make constellation

models out of marshmallows and toothpicks, and viewed a NASA astronomy video.

Dave Eisfeldt at Dean Highlands Elemenentary

When the viewing started we heard a lot of Wows! from the 100 plus students, teachers and families as they gazed at sunspots and Moon craters.


Johnny Barton at Dean Highlands elementary.

We were asked if they could schedule us to come back next school session in the fall so that they could see Jupiter and Saturn.

Dark Matter Changes (Again)

By: NASA, ESA, and A. Riess, STScL

Since the 1960s, astrophysicists have postulated that in addition to all the matter that we see, the Universe is also filled with a mysterious, invisible mass. Known as "Dark Matter", it's existence was proposed to explain the "missing mass" of the Universe, and is now considered a fundamental part of it. Not only is it theorized to make up about 80% of the Universe's mass, it is also believed to have played a vital role in the formation and evolution of galaxies.

However, a recent finding may throw this entire cosmological perspective sideways. Based on observations made using the NASA/ESA *Hubble Space Telescope* and other observatories around the world, astronomers have found a nearby galaxy (NGC 1052-DF2) that does not appear to have any dark matter. This object is unique among galaxies studied so far, and could force a reevaluation of our predominant cosmological models.

Also, the results further fuel the mismatch between measurements for the expansion rate of the nearby universe, and those of the distant, primeval universe — before stars and galaxies even existed.

This so-called "tension" implies that there could be new physics underlying the foundations of the universe. Possibilities include the interaction strength of dark matter / dark energy being even more exotic than previously thought, or an unknown new particle in the tapestry of space.

Galaxies appear to recede from Earth proportional to their distances, meaning that the farther away they are, the faster they appear to be moving away. This is a consequence of expanding space, and not a value of true space velocity. By measuring the value of the Hubble constant over time, astronomers can construct a picture of our

cosmic evolution, infer the make-up of the universe, and uncover clues concerning its ultimate fate.

This Hubble constant is needed to estimate the age of the universe and is one of the most important numbers in cosmology. It is named after astronomer Edwin Hubble, who nearly a century ago discovered that the universe was uniformly expanding in all directions—a finding that gave birth to modern cosmology. By measuring the value of the Hubble constant over time, astronomers can construct a picture of our cosmic evolution, infer the make-up of the universe, and uncover clues concerning its ultimate fate.

With finding a galaxy without dark matter, astrophysicists will continue to grapple with revisiting their ideas about the physics of the early universe and the Hubble constnat.

Astrophotography

By Aubrey Brickhouse.

Not many folks image just one large star. But Vega is one of my favorites so I just shot a nice wide filed of it and hope you enjoy.

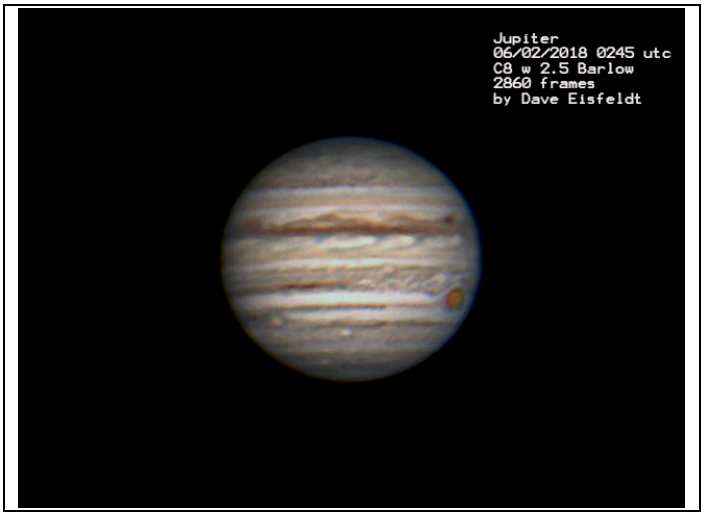
Vega, shot June 14, 2018, Aubrey Brickhouse

Correction: Last month, I incorrectly attributed a photo of M101 to J.Scarborough. It should be attributed to Aubrey Brickhouse.

M101

Jupiter

By: Dave Eisfeldt



Perseid Meteor Shower 2018: When, Where & How to See It This Week

According to Space.co, The Perseid Meteor shower's peak will be visible both **the nights of Aug. 11-12 and Aug. 12-13**. It results from from Earth passing through the path of Comet Swift-Tuttle.

NASA's meteor expert Bill Cooke said, This year the moon will be near a New Moon and will set before the Perseid show gets underway after midnight. This will make the Perseids probably the best shower of 2018. "

Skywatchers looking out for the Perseids should also be able to see Mars (visible until about 4 a.m. local time) and Saturn (visible until about 2 a.m. local time); Venus and Jupiter both set before the Perseids are best viewed (9:30 p.m. and 11 p.m., respectively)

Photographer Shreenivasan Manievannan captured this stunning view of a Perseid meteor streaking across the sky near Lake Jocassee in South Carolina on Aug. 12, 2015

Credit: Shreenivasan Manievannan

Meeting of McDonald Observatory Board of Visitors.

By: Dean Chandler

Last month I attended the summer meeting of the McDonald Observatory Board of Visitors. There were some items for CTAS.

- 1. Representatives were present from the Permian Basin Gas Production group, and there was a very amicable discussion about the light pollution that has begun to creep into Fort Davis from the north. Many seemed not to realize that McDonald had gotten legislation passed at the state level that imposes light restrictions on Davis County and all the counties that border on Davis County. In essence the light pollution is in violation. McDonald got each county to notify all the holders of drilling licenses that they were in violation. In addition the drillers' association sent similar notices
- McDonald has a full-time person, Bill Wren, working with the drillers to improve the situation. He has been giving lectures, making presentations on-site, and giving other guidance to promote better lighting practices. A major part of Bill's effort is to quantify the light level at McDonald Observatory, so we can measure resulting improvement.
- Hopefully all this will be good news for the Texas Star Party as well as McDonald Observatory.
- I was eating at the Black Bear Restaurant in the State Park, when I was approached by former CTAS'er Joe Skinner. He sent his regards to all who remember him, especially Paul Derrick, Dave Eisfeldt, and Dick Campbell. Joe moved out to Fort Davis some years ago, and has been working for the State Park.

Eclipsing Binaries and Exoplanet Transits

Willie Strickland and others are seeking to potentially photograph transiting stars. While trying to locate and photograph eclipsing binaries, the subject of exoplanet transits came up. They began searching for a database that held the information on both phenomena they were interested in and came up with the following :

http://var2.astro.cz/ETD/predict_detail.php?delka=262.3257&sirka=31.6811&STARNAME=HAT-P-14&PLANET=b

The database is searchable and includes the times of transit with beginning, middle and ending times in UTD time.

Below is the transit table for V1104 Her, a fast eclipsing binary star. The stars are a newly discovered periodic variable with EW type variability. with an orbital period that is extremely short.

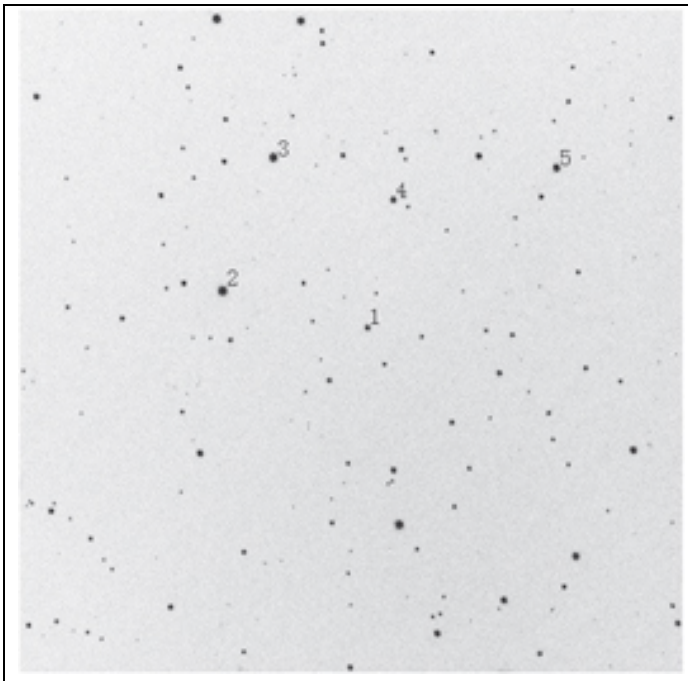
Your ELONGITUDE (in deg): 262 *0° - 360°*
Your LATITUDE (in deg): 31.6 *90° - 0° - -90°* submit

Transits predictions for NEXT 365 days.
ELONGITUDE: 262.3257° and LATITUDE: 31.6811°

Transit occurs below 20° in the sky. | During the daylight. | Observa

Tmid (HJD)	BEGIN (UT/h,A)	CENTER (DD.MM. UT/h,A)	END (UT/h,A)
2458336.786	06.08 5:45 (55°,NW)	06.08. 6:51 (42°,NW)	06.08 7:57 (29°,NW)
2458341.413	10.08 20:49 (23°,NE)	10.08. 21:55 (35°,NE)	10.08 23:01 (48°,NE)
2458346.041	15.08 11:53 (-12°,NW)	15.08. 12:59 (-18°,N)	15.08 14:04 (-20°,N)
2458350.669	20.08 2:57 (77°,NW)	20.08. 4:03 (64°,NW)	20.08 5:08 (51°,NW)

Partial data set for V1104, eclipsing binary stars.



The star labeled 1 is V1104. The other stars are comparison stars.

UPCOMING EVENTS	
Observatory Open House	**Aug 18**
Waco Sidewalk Star Party	**Aug 18**
Member Star Party	**Aug 11**
Observatory Open House	**Aug 18**
Hubbard & Belton Star Party	**Aug 18**

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