



# Carpe Noctem



## The News of Central Texas Astronomical Society

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Editor: Kent Swarts

### CTAS'ers DISCOVER ASTEROID MOON

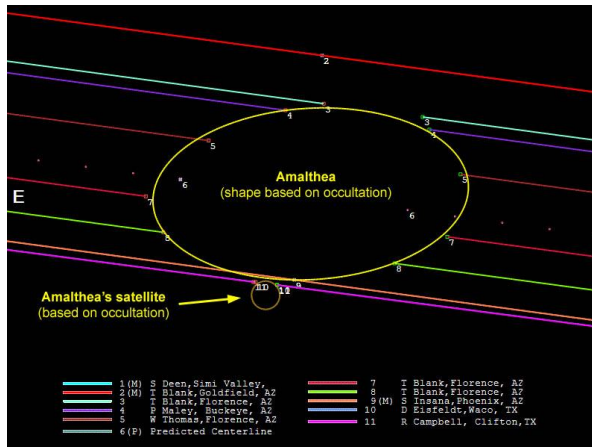
Serendipity, or happy accident, is a word I learned watching an old Disney movie. The Absent-Minded Professor was trying to invent one thing, and discovered something entirely different.

Dave Eisfeldt and I embarked on a challenge from Johnny Barton to try occultation timing, and wow, did we find something different. Occultation timings are events where the path of a planet, moon, or asteroid crosses and blocks the light of a star. It can be scientifically significant, because the data collected can actually trace the shape of the occulting body, and teach us things like its mass and orbital parameters. The International Occultation Timing Association (IOTA, an amateur group) organizes campaigns to collect timing data, report the result of the analysis, and maintain a database. Last March, the asteroid 113 Amalthea was predicted to occult the star TY 1878-01081-1. Paul Maley, a renowned IOTA observer, put together a team to observe this occultation. The normal method is to arrange observers at different latitudes across the shadow path, because the exact path is never known precisely. Paul contacted Johnny Barton of CTAS who is also an IOTA member, to add observers in our area. The track prediction had the shadow path going right across the Meyer Observatory. Johnny knew that I had recently acquired a used Astro video camera, and suggested I try it. Dave Eisfeldt had also attempted a few prior occultations and decided to observe from his house. Even though we were 45 miles apart, we were close in latitude, which is not desirable. On the

evening of March 14, we both readied our equipment. I was using the Meyer 24-inch and the vidcam in the 2-inch eyepiece adapter. For timing, I used a shortwave receiver to receive the WWV time signal. I had to dangle a wire antenna outside the dome to get a usable signal. I let my camera run for 30 minutes around the predicted time and never saw anything. After I got home, Johnny told me that Dave had seen a short blackout. I reviewed my video frame-by-frame and found a half-second wink out of the star.

Dave provided me the template to submit my data to IOTA, and that's where the fun began. I received an email from Paul saying there must be a discrepancy in my data, because they got a good trace of the asteroid, and the next observer to me (Isana) observed a clear miss. I knew that Dave had also seen a short wink out, and once Paul received Dave's data that confirmed my observation, the whole team went crazy. The best possible explanation was that Amalthea had a moon. The figure shows the results of the plots of all submitted data. Dave and my tracks virtually overlay because

of our similar latitudes.



I'll spare the details of the detailed analyses and questions. Suffice it to say, that a group of amateurs submitting this type of claim would receive a lot of skepticism from the professional community. After detailed analysis of the raw videos, and other research to discount rare occurrences, like a double star, the team concluded the result was that we had found a moon. Probably the most significant data point is Isana's, because without his clear miss, Dave and mine's tracks would not clearly show a different body. Paul Maley put together the official announcement to send to the Clearing House for Electronic Telegrams (CBET) at Harvard University. The announcement was accepted, and as a testimony to the thoroughness and professionalism of the team's work, the finding was given an official designation - S/2017 (113) 1, the first known satellite of 113 discovered in 2017. This is unusual in itself because even not all professional discoveries are given a designation until confirmed. You can read more about it on the Sky & Telescope web site at <http://www.skyandtelescope.com/astronomy-news/amateur-observers-discover-asteroid-moon/>

So, where do we go from here? This discovery is still classified as "probable". It will require independent corroboration to become a catalogued object. CBET released, to allow professional observers with adaptive optics time to plan to make observations next spring since Amalthea is no longer in the sky reappears. As for naming, that remains to be seen, and is subject to IAU rules.

A few confessions. When I said this was a happy accident, nothing describes it better. This was my first ever occultation timing attempt. I was using a camera that is regarded as limited by IOTA,

and my timing method is regarded as obsolete. The fact that Dave and I were at such close latitudes would normally be undesirable, but if we had been further separated, one or both of us might not have seen anything, and there would be no corroboration of independent observations. We were fortunate to have been in the right place at the right time. However, we had the observational experience to collect good data and follow good experimental procedures. Credit also has to go to Paul Maley and the analytical team for the professional rigor with which the conclusions were reached. Without their analysis, I doubt anyone would have just believed Dave and I. This has been an experience of a lifetime for me.

*Dick Campbell*

## President's Letter: July\_August 2017

I hope all of you are having a good summer. Our club is getting really busy as the local groups are requesting that we support them at their August 21 eclipse parties. Even though many of us are planning to go north to be in the direct path of the full eclipse, those that stay can still enjoy viewing and imaging the partial event in our area. We should have about 60 percent or so of the surface of the sun blocked. Please use extreme caution in viewing with the proper Sun filters and glasses.

June 24<sup>th</sup> brought us the first of our Star B Ques and we thank the Rachuts and Dave Eisefeldt for handling the event. The first of the summer Star B Que series was a great success and we saw many new members out and many set up telescopes. I also saw some new equipment.

Our second Star B Que was on July 22 and again "The Rachut Maison de Cuisine" catered the event along with Dave Eisefeldt. We began the evening with the General Business Meeting at 6:00pm followed by a program on "The Major discovery of 2017 by Dick Campbell and Dave Eisefeldt" at 7pm. Johnny Barton led the program. We followed the meeting with viewing on the field.

CTAS will be celebrating our 25<sup>th</sup> anniversary next year (2018) and we plan to use the upgrade as the focus of our 25<sup>th</sup> year in Central Texas providing Astronomy opportunities to members and the public. My first term as your President was when we celebrated the 20<sup>th</sup> anniversary and, thankfully, most of the former

officers and directors will still be around to contribute to the 25<sup>th</sup> anniversary.

I want to thank all of our members who do so much outreach work to bring awareness of Astronomy to our central Texas area. If you really want to “up your game” in astronomy, you need to volunteer to help in many of the events we hold each year.

Finally, please consider donating to CTAS to help us cover the costs of upgrading the 24” Telescope package. It will improve our operation immensely. You can donate on the web site by credit card or send a check. We appreciate any and all support.

*Aubrey Brickhouse*

*President*

## **Waco Library Star Party**

*By: Kent Swarts*

The Waco Public Library hosted a public star party the night of June 23, 2017 at Cameron Park. CTAS provided the scopes and expertise. Johnny Barton, Dave Eisfeldt, Bernard Ott and Kent Swarts set up scopes on Saturn, Jupiter and other nearby objects. Angela Lightfoot, the organizer for the library told us she counted 160 attendees. A success by any standard.

People asked great questions, had intriguing observations about the objects they saw and had a wonderful time. We facilitators thoroughly enjoyed our role and making so many people happy.



The observing field and scopes before everyone arrived.



The crowd arriving shortly before dark.

It is rewarding to volunteer time to educate the public. Perhaps of all the people that came only ten or so had ever looked at the sky through a telescope. They were amazed and overjoyed to see the rings of Saturn, the Red Spot on Jupiter or its moons for the first time. They have heard about these, but had no knowledge. We had an equally great time

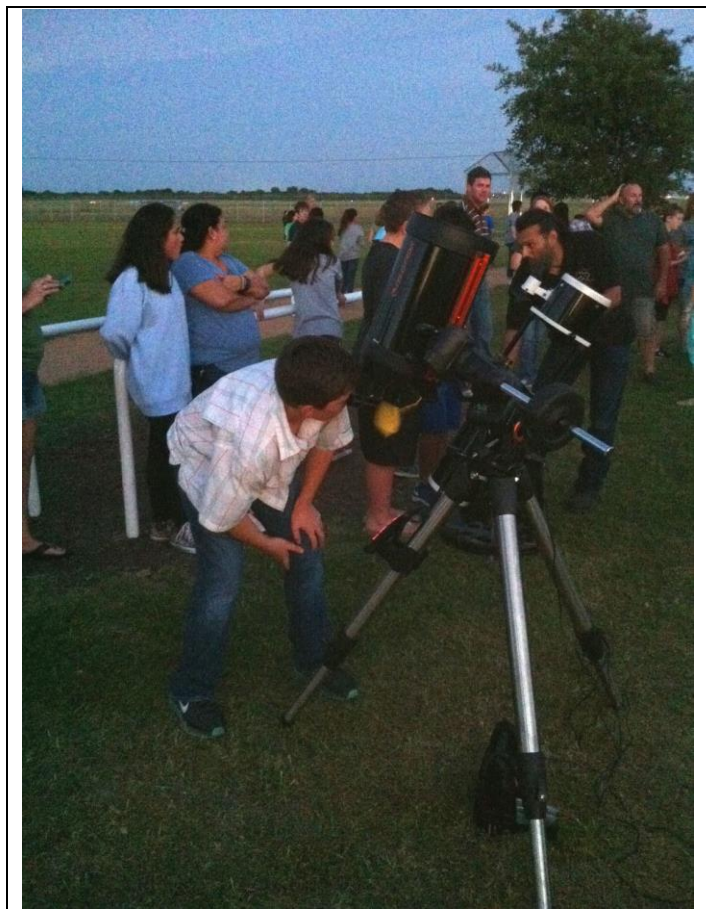
Johnny writes: Thanks for everyone's help last Friday night at the Waco-McLennan Co. Library Stargazing Event at Cameron Park. I heard a lot of "Thank you" from everyone who came by my location, and appreciation from the library staff.

## **China Spring Intermediate School May 2, 2017**

*By Dave Eisfeldt*

CTAS held a star party on the evening of May 2, 2017 at the baseball field next to China Spring Intermediate School. The star party was at the request of China Spring school teacher Vicky Hall. About 200 students and adults attended the event. Everyone enjoyed the evening.





CTAS was represented by members Johnny Barton, Dave Eisfeldt, Dan Doyle, Michael Gonzales, Paul Derrick, Mike Green, and Garrett Mathesen. It was a pleasure to see Paul Derrick visiting from Denver Colorado. Members brought their own scopes. Since the airport was across the street and the time of the event was one day past a first quarter moon our view was limited to the moon and Jupiter. Also, clouds obstructed the view at times. This did not deter some good viewing. At times the equatorial belts were clearly seen when occasional clouds tempered the brightness of the planet. The telescopes used were a refractor, a Newtonian, and three eight-inch Schmidt-Cassegrains. The students were able to see Jupiter and the Moon thru a variety of different telescopes.

## Exoplanet News

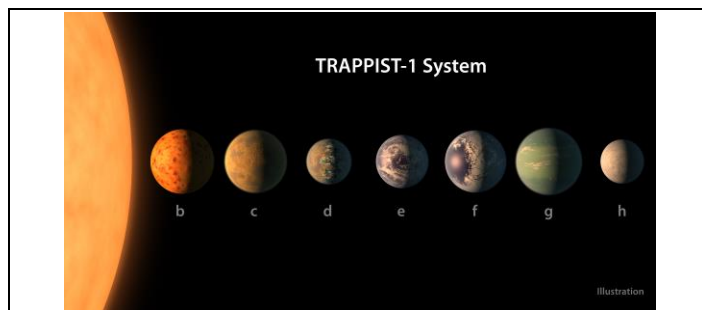
*By: NASA*

NASA's Spitzer Space Telescope has revealed the first known system of seven Earth-size planets around a single star. Three of these planets are firmly located in the habitable zone, the area around the parent star where a rocky planet is most likely to have liquid water.



Artist's rendition of the planets.

The discovery sets a new record for greatest number of habitable-zone planets found around a single star outside our solar system. All of these seven planets could have liquid water – key to life as we know it – under the right atmospheric conditions, but the chances are highest with the three in the habitable zone

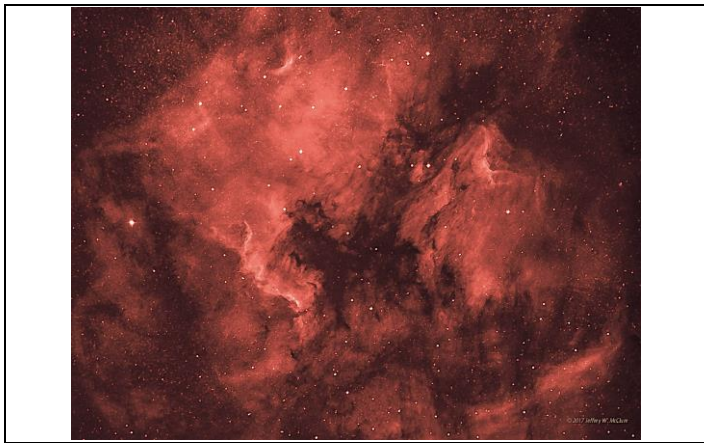


At about 40 light-years (235 trillion miles) from Earth, the system of planets is relatively close to us, in the constellation Aquarius. This exoplanet system is called TRAPPIST-1, named for The Transiting Planets and Planetesimals Small Telescope (TRAPPIST) in Chile.

## Nebulas

*By: Jeff McClure*

Last night (7/23-24/2017) I got about an hour's break in the clouds and imaged the North America and Pelican nebulae in hydrogen alpha for five 600 second exposures before the clouds returned. This was shot using a Canon f2.8 70-200 lens at 200mm with an SBIG 8300M camera, mounted on my old Orion Atlas. I was using a Berlebach wood tripod, which I have found to be an amazing improvement over the old metal tripod I was using. I captured and did noise reduction, stacking, and stretching in Nebulosity 4, then sharpening and coloring in Adobe Lightroom. Final touches were done in Apple Preview.



**Observatory Open House      Aug 12**

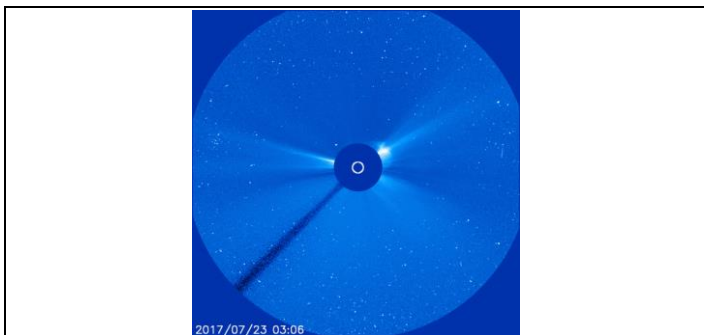
**Hubbard & Belton Star Party      Aug 12**

**Member Star Party      Aug 19**  
**with Star-B-Que**

## **Solar CME**

*By: NASA*

On Sunday, July 23rd, a spectacular coronal mass ejection (CME) emerged from the farside of the sun. Coronagraphs onboard the orbiting Solar and Heliospheric Observatory (SOHO) tracked the fast moving cloud, as it billowed into space:



See the ispectacular video at  
[http://spaceweather.com/images2017/23jul17/  
cme\\_c3\\_anim.gif?PHPSESSID=nqac8otgguulvrtt2p  
tdh8ea21](http://spaceweather.com/images2017/23jul17/cme_c3_anim.gif?PHPSESSID=nqac8otgguulvrtt2ptdh8ea21)

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