MONTHLY MEETING

Friday, Feb 14, 2020

ETC 2.136 - UT Campus
Engineering Teaching Center
Dean Keeton and Speedway

6:30 PM - 7:30 PM
PRACTICAL ASTRONOMY
The Astronomical League: Adventure, Astronomy, Resources, The Reflector, Observing Programs, and PINS! (Page 4)

7:30 PM - 9:00 PM
GENERAL ASSEMBLY
Featured Speaker: William Ambrose
Dangerous Places in the Solar System
Be sure to join us this Friday night at 7:30 to learn where you DON'T want to go for a pleasant Solar System vacation. Bill Ambrose, a geologist with the Bureau of Economic Geology, in addition to earthly geologic research has a special interest in planetary geology.

Call to Arms!

Can you believe it's already 2020? It seems like just yesterday we were all wondering if the lights would go out when the calendar changed from 1999 to 2000. Well, satellites didn't fall out of the sky then, but I still want my flying car or jet pack now – how about you?

Last month I talked a little about the future of AAS and how what that future looks like will depend on who would be willing to step forward to help us serve our members and our public, and who would take action to help shape and enable that future. That dependency on our members is truer than you might think.

AAS has been blessed to have a stalwart, core group of talented individuals that have been willing to serve on the Executive Committee (EC), many for 10 years or more in various positions. During the last 10 to 12 years, there has been some changing of the guard, but not much. On one hand, this continuity has enabled us to formulate and execute on some important long-range plans. But on the other hand, it has also made it more difficult for our organization to grow and transform to meet the changing needs of our membership – something we must do if we're to continue to attract and serve an ever younger, population.

For the last several years, we've been finding it increasingly difficult to fill all the positions on our EC. This year, we're experiencing the pain of some key vacancies. The current EC has been working hard to keep the lights on, but our ability to do more than that has suffered, and there's no way
President’s Notes Continued

this will change if we don’t get help.

January is the time of year when we form the nomination committee who will put out the call for volunteers who are willing to serve on the EC. I have two asks of you:

1. Please consider stepping up now to serve on the current EC; the term runs through May. We’re desperately looking for someone to serve in the roles of Vice President and Communications.
2. Please consider serving on the EC next year and beyond.

As we’re still celebrating our 50th anniversary, I can’t help but wonder who will step up to be a part of the next 50 years. Who will members that haven’t even been born yet look back and thank for leading AAS into the next era of its existence.

I think that could be you!

Thanks, and Clear Skies,

Jim

______________________________

NOMINATING COMMITTEE

The Nominating Committee is looking for members who are willing to be nominated for officer positions for the year beginning in June 2020. The positions to be filled are:

- President
- Vice-president
- Secretary
- Treasurer
- Communications Chair
- Equipment Chair
- Member Services Chair
- Outreach Chair
- 6 Members-at-Large

A description of the duties of each officer can be found in Article 4 of the bylaws, https://austinastro.wildapricot.org/resources/Documents/bylaws/2019%20amended%20bylaws.pdf

If you are interested in running for office or have questions, you can email the Nominating Committee at nominate@austinastro.org
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**AAS AFFILIATIONS**

- **International Dark Sky Association**
  - [http://darksky.org/](http://darksky.org/)

- **Night Sky Network**
  - [https://nightsky.jpl.nasa.gov](https://nightsky.jpl.nasa.gov)

- **Astronomy League of Texas**
  - [https://www.astroleague.org/](https://www.astroleague.org/)

- **Texas Space Grant Consortium**
  - [http://www.tsgc.utexas.edu/](http://www.tsgc.utexas.edu/)
Though this corner of the AAS universe has been a bit dormant for a while, I am proud to announce that things are back up and running. As your Astronomical League Correspondent (ALCOR) it is my responsibility to bring you all the latest and greatest news from the AL. As part of the Member Service Committee it is my duty to work with those of you who are looking to begin or complete an AL observing program. It is a personal goal of mine, in these two roles, to help AAS members find the joy and camaraderie in observing under the night sky. Astronomy is great and it is even better with friends.

In the coming months I will be present at our Member Star Parties looking to lend a helping hand to those of you wanting to make more out of your astronomical observing. Are you looking to get to know the sky better? Do you want to be recognized for your many observations? Do you need someone to mentor you on the operation of your equipment? Or, are you someone with a vast knowledge of skills and looking to help a fellow astronomer? No matter what your area or interest or need, let me assist you in your endeavors.

March is fast approaching and it is the one month out of the year that is optimum for observing the Messier objects in our own way, with a marathon. You can’t just jump into running 26.2 miles without training, just like you shouldn’t take on observing 110 objects in a night without some preparation. Join me on the observing field at this month’s Member Star Party to learn the ins and outs of the Messier List. Whether you are out to do the marathon, looking to complete the AL list, or just wanting to learn the sky; we can do it all and do it together.

Another event on the horizon is the Astronomical League’s annual convention, known as the ALCON. This year the four-day event will be hosted by The Albuquerque Astronomical Society (TAAS) in Albuquerque, New Mexico from July 15 to July 18. Currently on the schedule for the convention is an evening presentation by Apollo 17 astronaut Harrison Schmitt and a tour of the Very Large Array (VLA). Join me this coming Friday at Practical Astronomy to learn more about the ALCON, the AL in general and much more.

Clear Skies,

Dawn
What happens when a star dies? Stargazers are paying close attention to the red giant star Betelgeuse since it recently dimmed in brightness, causing speculation that it may soon end in a brilliant supernova. While it likely won’t explode quite yet, we can preview its fate by observing the nearby Crab Nebula.

Betelgeuse, despite its recent dimming, is still easy to find as the red-hued shoulder star of Orion. A known variable star, Betelgeuse usually competes for the position of the brightest star in Orion with brilliant blue-white Rigel, but recently its brightness has faded to below that of nearby Aldebaran, in Taurus. Betelgeuse is a young star, estimated to be a few million years old, but due to its giant size it leads a fast and furious life. This massive star, known as a supergiant, exhausted the hydrogen fuel in its core and began to fuse helium instead, which caused the outer layers of the star to cool and swell dramatically in size. Betelgeuse is one of the only stars for which we have any kind of detailed surface observations due to its huge size – somewhere between the diameter of the orbits of Mars and Jupiter - and relatively close distance of about 642 light-years. Betelgeuse is also a “runaway star,” with its remarkable speed possibly triggered by merging with a smaller companion star.

If that is the case, Betelgeuse may actually have millions of years left! So, Betelgeuse may not explode soon after all; or it might explode tomorrow! We have much more to learn about this intriguing star.

The Crab Nebula (M1) is relatively close to Betelgeuse in the sky, in the nearby constellation of Taurus. Its ghostly, spidery gas clouds result from a massive explosion; a supernova observed by astronomers in 1054! A backyard telescope allows you to see some details, but only advanced telescopes reveal the rapidly spinning neutron star found in its center: the last stellar remnant from that cataclysmic event. These gas clouds were created during the giant star’s violent demise and expand ever outward to enrich the universe with heavy elements like silicon, iron, and nickel. These element-rich clouds are like a cosmic fertilizer, making rocky planets like our own Earth possible. Supernova also send out powerful shock waves that help trigger star formation. In fact, if it wasn’t for a long-ago supernova, our solar system - along with all of us - wouldn’t exist! You can learn much more about the Crab Nebula and its neutron star in a new video from NASA’s Universe of Learning, created from observations by the Great Observatories of Hubble, Chandra, and Spitzer: bit.ly/CrabNebulaVisual

Our last three articles covered the life cycle of stars from observing two neighboring constellations: Orion and Taurus! Our stargazing took us to the “baby stars” found in the stellar nursery of the Orion Nebula, onwards to the teenage stars of the Pleiades and young adult stars of the Hyades, and ended with dying Betelgeuse and the stellar corpse of the Crab Nebula. Want to know more about the life cycle of stars? Explore stellar evolution with “The Lives of Stars” activity and handout: bit.ly/starlifedeath

Check out NASA’s most up to date observations of supernova and their remains at nasa.gov.
Thanks to AAS members, Alan and Caroline Carruth, we have a fantastic new Dark Sky Site for the use of all members.

A porta potty serviced frequently is available. There is no power or water available so plan accordingly.

Come on out and enjoy great observing with friends under dark skies.

If you have questions, please contact Tim Brown (me) at: memberservices@austinfoastro.org.

**Members Only star party - Feb 22, 2020**

**Members’ access rights and responsibilities**
We must always remember that this site is the private property of Alan and Caroline and we can use it for the club only by their gracious consent. Always take care to follow the few, very reasonable rules below:

**Members in good standing have access for:**
- Members only star parties
- Non-public, **members only** astronomical observing
- Members may camp overnight in connection with such activities

**Duties:**
- Individual AAS members must first give Alan email notification of their plan to observe and receive approval by owner.

**Prohibited Activities**
- Discharge of firearms or fireworks
- Loud music
- Tampering with fences or gates
- Hunting of any sort
- Activities which materially interfere with owners use and enjoyment of his/her adjacent lands.
- No access to owner’s structures
- Don’t damage, deface or destroy any property or improvements
- AAS members are responsible for closing and locking all gates when leaving
Members of the Austin Astronomical Society have access to our private dark sky site and the opportunity to borrow an 8-inch reflecting telescope for four months. Your Austin Astronomical Society membership also includes belonging to the Astronomical League. You receive their quarterly Reflectors magazine and the opportunity to participate in their many guided challenges in observation, such as checking off your views of all 110 Messier objects. And they have an annual convention to attend with its star party.

In addition, I just joined the American Astronomical Society. At core, this is a professional organization. If you want to join as an amateur, you have to check off the box saying that you do not earn your primary income from the study. I did that. I also signed on for two subgroups of special interest, Dynamical Astronomy and History. The bill came to $87.

Even though the time scales can be long, the sky does change. Objects orbit each other. They move linearly relative to each other. Like most personal attractions, celestial mechanics is not the kind of thing that you get other people passionate about. Mostly, their eyes glaze over. Sometimes, even if they own telescopes, they seem to fall asleep while you are talking to them.

The fact remains that even though Newtonian mechanics is the foundation of modern astronomy, it is wholly insufficient to describe cosmic events. I do not mean relativity and quantum mechanics, but just three bodies, like the Earth, the Moon, and the Sun. The equations we learned in freshman physics – \( F = ma \); and \( F = G \frac{Mm}{R^2} \) – cannot be extended beyond two bodies. Some restricted three-body problems have been solved with numerical methods, but predicting the motions of the moons of Jupiter, the rings of Saturn, the Pleiades, and the Orion nebula remains intrac-
table. So, just for myself, reading about dynamical astronomy promises to open up wide vistas, broad horizons, and deep views of how real objects truly move in measurable space.

Rather than waxing eloquent about history, I will just cite The Structure of Scientific Revolutions by Thomas Kuhn. In college, we were handed physics, chemistry, and the other sciences as finished works. But they are not finished. And the past is prolog to the future.

I recently subscribed to both Sky and Telescope and Astronomy magazines. They come with electronic delivery for ease of access. Sky & Tel is the older periodical with a long and distinguished pedigree. It is now published by the American Astronomical Society. If you join the AAS first—which I did not—you can get a discount on
the magazine. My interest in *Astronomy* magazine is based on their different editorial staff and array of occasional authors. I know from other hobbies that such competition brings a binocular view. You do not need to subscribe to either magazine to benefit from their websites. Both provide night sky information adjusted to your time and place. In addition, you will find news, features, pictures, and retail sales of accessories. It was *Sky & Tel’s* free online night sky maps that sold me on subscribing. I also have Favorites links to several observatories, but their presentation, menuing, and other design features just felt easier to use. Previously, I relied on the U.S. Naval Observatory, but their “sky now” site with rise, transit, and set times for planets and bright stars is down for repairs and upgrades.

As I became more active in astronomy, I signed up for two discussion boards, Cloudy Nights and The Sky Searchers. Both are international. Cloudy Nights is the more senior with a much larger community of active amateurs, and therefore a much richer array of discussion forums and topics. Cloudy Nights is owned and operated by Astronomics, a recognized seller of equipment from Norman, Oklahoma. The Sky Searchers is run by a guy named Gordon from Cottonwood, Arizona, with help from a team of administrators. For whatever reasons, I found The Sky Searchers more to my liking.

The Austin Astronomical Society has a Facebook page. I joined about a month ago, but I never was a big Facebook user. In the past two years, most of my engagement was for the Texas Military Department because I was assigned to be the public affairs officer for the State Guard Maritime Regiment. However, I retired from the Guard last October, and I never found much attraction in Facebook. So, someone else will have to address that.
Late February and early March are, historically, the cloudiest period of the year in Austin. So it takes a determined observer to get out now. But if you fit that description, the deep sky as always has plenty to offer. The winter Milky Way is sinking into the west but still up, followed in the east by Leo, Hydra and the galaxy-filled skies of early spring. So if you have the chance, rewards are waiting. Get out and enjoy!

**M38**  
*rating: EASY  
open cluster in Auriga  
RA 5h 28.7m  Dec +35d 50.0’ (2000)  
Magnitude 6.4*

Also known as NGC 1912 and the Starfish Cluster, M38 was originally discovered by Giovanni Hodierna before 1654, then re-discovered by Le Gentil in 1749, and re-discovered for the last time in 1764 by Charles Messier. Messier put the cluster into his catalog, eliminating the necessity for future re-discoveries.

Finding M38 is easy, at least assuming you’re familiar with the the pentagon of Auriga. The northernmost star in the pentagon is Capella - the brightest star in Auriga. The southernmost star in the pentagon, due south of Capella, is El Nath. If you aim binoculars at El Nath, and move about 1/3 of the way north toward Capella, you’ll find two conspicuous star clusters. The dimmer of the two is M38. The brighter, about 2.5 degrees SE, is M36. Still further to the SE, past M36, is a third cluster, M37.

M38 lies at a distance of 4000-4500 light-years along with its neighboring clusters M36 and M37. The three clusters form a curving line that almost fits in a binocular’s field of view. But because their brighter stars are only 9th magnitude, most binoculars show them as unresolved cotton puffs. A telescope is needed to resolve them into star swarms.

M38 itself is about 220 million years old, and is part of the great Auriga OB1 association of young stars. The cluster contains roughly 100 stars. Visually it’s often described as forming an oblique cross with a star at its center, though in large aperture scopes on a good dark night, identifying any specific geometric shape can be fruitless. M38 is highlighted by a prominent yellow giant star with an apparent magnitude of 7.9. By comparison, the Sun at the same distance would have apparent magnitude 15.3.

**NGC 2300**  
*rating: MEDIUM  
galaxy in Cepheus  
RA 7h 32.1m  Dec +85d 42.5’ (2000)Magnitude 10.8*

If you like circumpolar observing, here’s your cup of tea. Located in northern Cepheus just 4 degrees from Polaris, this galaxy is the brightest in a small group named, appropriately, the NGC 2300 group. Another group member, 11th magnitude face-on spiral galaxy, NGC 2276, is only 6’ NW. And a much fainter 14th magnitude galaxy, IC 455, lies about 11 SSE. So with this target, you get three for one, if your scope is up to it. NGC 2300 is faintly visible in a 6-inch telescope, but a 10-inch shows it better, with a slightly elongated halo, a broadly bright core and a stellar nucleus. Nearby NGC 2276, on the other hand, is barely visible in a 10-inch scope, and appears diffuse without any central condensation. It’s also located just 2’ ENE of an 8th magnitude star that interferes with viewing. Palomar Sky Survey images show it to be a distorted face-on spiral, which almost looks like the 8th magnitude star’s light is blowing the arms away from it. We all know better, of course (right?). As for 14th magnitude IC 455, expect to use at least a 12-inch. You’ll see a small faint object fairly well concentrated to a stellar nucleus.

One side note on the NGC 2300 group: X-ray observations show a massive hot gas cloud about 1.3 million light years
across centered on the group. The combined gravitational attraction of the 3 galaxies is insufficient to hold this gas in place; some 20 trillion additional solar masses is needed. This suggests that the NGC 2300 group, and other small groups like it, contains a lot of dark matter. Probably gray socks like those that keep disappearing when I wash clothes ...

900 rating: HARD planetary nebula in Gemini
RA 6h 25.9m Dec +17d 47.2’ (2000)
Magnitude 11.7

Here's a nice planetary located right between the feet of the Gemini twins, almost on the Orion border. Look for it about 3 degrees NW of 2nd magnitude Gamma Gem (Alhena). It’s easy to see at low power without a filter in most telescopes, appearing as a slightly swollen 12th-magnitude "star". At higher powers, the planetary transforms into an elongated haze about 10 arcseconds in diameter with a small central disk. But the 16th magnitude central star usually eludes detection in scopes as large as 12 inches. By the way, in case you don't care for cryptic letters, the proper name of the nebula is Jonckheere 900, discovered in the early 1900s by astronomer Robert Jonckheere.

HUFFLEPUFF OBSERVATORY
Watch Live

I kid you not... Club member Deanna Rose Bressie has a website for her astronomy projects.

https://www.hufflepuffobservatory.space

She does live streamings, posts her photos, and so on. Deanna helped at our outreach at Akin Elementary last November. (See the December issue of Sidereal Times.) She brought two Celestron computer-guided telescopes and a power tank to run everything.
January 18th 2020 Star Party at Pedernales Falls State Park
Photos by Steve Farmer
OUTREACH REPORT  FEBURARY 2020
By Joyce Lynch, Outreach Chair

There were a lot of outreach events in January and early February.

On the 11th we went to Liberty Hill to work with a large group of Girl Scouts and their families. Tom Campbell, Tom Richter, Steven Bingham, and my husband Jim joined me there.

The sky was cloudy on the night of the West Side Elementary School event on January 16, but Tom Campbell, Jim Moyle (with a button-making machine that was a big hit), Jim and I did an indoor program with Stellarium and a telescope looking at photos on the wall.

For the January 18 star party at Pedernales Falls State Park we had to change our location due to a recent prescribed burn that made the Star Theater unusable. The swimming area parking lot gave us a reasonable sky, although trees did block some of the horizon. There were about 110 visitors, and many of them were treated to a very bright pass of the ISS. Astronomers in attendance included Steven Bingham, John and Cindy Cassidy, Carol Edwards, Steve and Lisa Farmer, Jim Gardiner and daughter Lydia, Jim Moyle, Tom Richter, Ramon Salvania, Gordon Schaefering, Bob Snyder and daughters Mattie and Abbie, Lisa and Tim Sullivan, Haku Sato and son David, Greg Rohde, Terry Phillips, Mike Albrecht and Shirley Powers, and Jim and our son David.

On the 22nd at Kathy Caraway Elementary Tom Campbell and Mike Marotta worked inside on a cloudy night to show students at the science fair pictures of planets through a telescope.

The next night Tom Campbell helped out once again at Great Oaks Elementary, with Jim Moyle and Lawrence Young. Tom reported that they “saw over 100 parents, students and teachers. We set up in the open area, it went really well. Sky was very clear and we were able to share views of Venus, Orion Nebula and other targets. I brought the wooden Dob, it seems ideally suited to size of the students, only a few had to stand on my eyepiece case to see the Trapezium in the Orion Nebula. Very well attended event.”

We had been scheduled to go to Park Crest Middle School in January, but the school decided to postpone due to cloudy skies. The star party was rescheduled for February 4, and once again the sky didn't cooperate. But, a bunch of us went anyway and spent time indoors talking with students and parents about telescopes and other astronomical topics. The bunch included Terry Phillips, Mike Marotta, Tony Cagnolatti, Greg Rohde, Gordon Schaefering, and Jim and I.

The weather was better on February 6 when Mike Marotta, Lawrence Young, Jerry Mladenka, and Tony Cagnolatti went to Dessau Elementary.

WHAT’S COMING UP IN THE NEXT MONTH
February 15    Public star party at Pedernales Falls State Park, 6:00-9:00
February 22    Girl Day at UT  11:30-4:30
February 29    Public star party at Inks Lake State Park
March 3       Star party at Dessau Middle School in Pflugerville

WHAT ASTRONOMICAL APPS DO YOU USE?
Mike Marotta and I have been working on a handout for visitors at star parties, and we would like to include some phone and tablet apps that they might like to try. Please email outreach@austinastro.org to let us know which one(s) you use.

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Practical Astronomy
6:30 PM
General Assembly Meeting
7:30 PM
@ ETC 2.136 - UT Campus
Engineering Teaching Center
Dean Keeton and Speedway

15 Feb. 2020
Public Star Party
6:00 PM - 9:00 PM
@ Pedernales Falls State Park

22 Feb. 2020
Members Only Star Party
6:30 PM - 11:00 PM
@ Bad Wolf Ranch

29 Feb. 2020
Public Star Party
6:00 PM - 8:30 PM
@ Inks Lake State Park

13 Mar. 2020
General Assembly Meeting
7:30 PM
@ ETC 2.136 - UT Campus
Engineering Teaching Center
Dean Keeton and Speedway

21 Mar. 2020
Members Only Star Party
7:30 PM - 11:00 PM
@ Bad Wolf Ranch
Pflugerville Outreach Events Successful
By Michael E. Marotta

We brought our telescopes and enthusiasm to Park Crest Middle School and Dessau Elementary School in Pflugerville on February 4 and February 6. Tuesday the 4th, the sky was cloudy as the weather turned to frost and snow overnight. Even the Moon was covered before the kick-off. Ever flexible, we brought our telescopes indoors and set up pictures of planets and stars down a long corridor. That allowed Jim, Joyce, and the team to discuss astronomy, instruments, and the challenges and rewards in observing.

Thursday night was clear. Dessau Elementary was celebrating STEAM Night (science, technology, engineering, art, and mathematics) with hands-on activities in several rooms and halls. UT students ran a cardio outreach in the gym. It was night of the science fair, and winners were selected to go to the Austin Energy Regional Science Festival later in the month.

We had enthusiastic viewers out on the running track where we trained our scopes on the gibbous Moon and Venus.

We had four instruments on the field, three large, one small, and also pair of binoculars. Lawrence brought a Celestron 8-inch Schmidt-Cassegrain reflector on a computer-guided equatorial mount. He said, “I had an amazing time, the kids (and the parents) were great. Haven’t seen this much enthusiasm for quite some time. I took a picture of the moon using each person’s phone held up to the eyepiece. And that was a huge hit with all of them.”

The school staff was supportive and engaged, directing people out to the field for us, and lining up to view the sky. We all received thank-you cards with candy.

Caption: Lawrence snaps the Moon.

Other Up Coming Events

AGM
Mark your calendar for the November 12 -15, 2020 IDA Annual General Meeting (AGM) in San Antonio!

Texas Night Sky Festival® at McDonald Observatory
Get ready to enjoy a little West Texas on April 24 & 25, 2020 when McDonald Observatory runs the Texas Night Sky Festival®. They will be hosting events and trainings before and after the main event. Check their website for details.
I finally received my mirror back from the re-coaters. I've been working on this since early October. But the story really began back in early spring. Let me explain as briefly as I can.

I always like a bargain, so I sometimes go to garage sales on Saturdays. I happened on a sale near my house and noticed an Orion 6 inch Dobsonian in the driveway. I have fond memories of a 6 inch I had built from an Edmunds Scientific mail order kit many years ago—-in the early 1970’s. I still have that mirror around here somewhere, but the rest of it is long gone. (The tube was made of sheet vinyl roll tube. The mount was of 2 by 4 lumber and plumbing fittings. It worked, sort of. I discovered the moon and M31. Locating a thing to observe was a real challenge.) I thought it may be fun to rekindle my old hobby with a more modern scope. I was almost afraid to ask what they wanted for it. To my astonishment, they practically gave it to me. (The tube was made of sheet vinyl roll tube. The mount was of 2 by 4 lumber and plumbing fittings. It worked, sort of. I discovered the moon and M31. Locating a thing to observe was a real challenge.) I thought it may be fun to rekindle my old hobby with a more modern scope. I was almost afraid to ask what they wanted for it. To my astonishment, they practically gave it to me. They just wanted it gone and out of their garage. I came home with a nearly complete Orion 6 inch Intelliscope.

There is a port on the side that looks like an old telephone mod jack. But whatever plugs into it is missing. Also, there are no motors and gears, hand-set or electrical connectors like my hobby killing Celestron 114mm NexStar has. After doing some research and catching up with the times a little, I discovered that Intelliscope means a push-to system rather than a go-to system. Who knew? I had to try to find the handset. But that is not all. The intelliscopes come with an azimuth encoder installed in the base. But you have to buy the altitude encoder and hand-set as an add-on kit if you want to use the intelligent capability. I think Orion’s idea was to keep the sticker price lower by leaving it off. That way the buyer can purchase the telescope with this paycheck, and the push-to kit with the next month’s paycheck.

I went to the Orion website and found the needed items, but was a little shocked with the price. I was worried about mission creep. I had not planned to sink a lot of money into what was a garage sale bargain. It was, after, just a 6 inch scope. So I shopped on Ebay, Amazon, Craigslist, Cloudy Nights Classifieds and any other source I could think of. No success. I found a handset on Ebay, but no encoder. The closest I got to an altitude encoder was a guy named Butch who was selling an Orion 8 inch intelliscope on Craigslist. Maybe he had an encoder assembly he would be willing to part with cheap. I made a phone call.

Butch had no idea what an encoder assembly was, but said that I was welcome to come look at it to see if I could identify one. His address was way on the other side of town. After the usual fight with Austin traffic I found the address. I went to the door and met Butch. I was welcomed in and immediately I saw the eight inch everything changed. It was love at first sight. The 6 inch was suddenly unimportant. Buying handsets and encoders for a 6 inch was one thing. For an 8 inch it’s something else entirely. When love is involved, mission creep is no object.

I bought Butch’s 8 inch Orion Intelliscope. I went to the Orion website and bought the handset and encoder assembly kit. I had just progressed to a new level. Time to try it out.

The honeymoon was over almost as soon as it began. I drove out to a dark place and set up. I was quite pleased with the Orion push-to system. In no time at all I had racked up a doz-
en or more objects. Messiers, open clusters, globulars, a nebula or two. I could never have found all that with my old home spun Edmund kit scope. But there was something wrong. I wasn’t seeing a really sharp image. The 6 inch shows Jupiter’s bands clearly. The 8 inch barely at all. With the 6 inch I can see the Cassini division. The 8 in just a solid blur. I aligned the optics. I waited for better seeing conditions. No improvement. I cleaned the mirrors as per instruction with tepid water with a little dish soap and a cotton ball. I rinsed with distilled water. I chased droplet with compressed air. I collimated, and tried again. Still no good. I removed it again and examined it very carefully. I shined a bright flashlight at an oblique angle. Then I could see it. The surface of the mirror looked like it was completely covered with dust. It looked like a mud flat that had dried into a vast network of cracks. The aluminum substrate beneath the protective coating was deteriorated.

I read reviews about mirror coaters. I settled on Alcoat, with Bob Fies. He was once friends with John Dobson, and had coated lots of mirrors for him. He had good reviews. I packed up the mirror and diagonal, wrote a check and mailed it off. About three weeks later the box arrived an my doorstep. I opened the box and was admiring my new mirror when I noticed some dust particles on it. I took a breath and blew the dust off. Doing so caused me to accidentally cough. Oops! Now the whole mirror had glop on it. Not to worry. I’ll wipe it clean with my soft lens cleaning cloth I use for my glasses. Hmmm. That seems to have made it even worse. I did the soap and water with cotton balls again. Now it looks great again. Time to try it out.

Something has gone terribly wrong. The imaging problems are even worse that before. Not only does Jupiter have no bands, and Saturn have only one ring, but stars don’t seem to focus at all. Just as a test I put a 6mm eyepiece and shot Altair. What I saw looked exactly like a fourth of July sparkler, complete with realistic motion!

I removed the mirror yet again. The oblique flashlight beam showed nothing remarkable. I placed the mirror on the stage of my dissecting microscope and turned to 40x. I could now see the surface which was covered with a million tiny scratches, as though I had worked it over with a wire brush. I should have known better. Mr. Fie’s website clearly explains not to touch the surface with anything. A blog I had read somewhere stated that the SiO2 protective coating takes at least 6 months to harden. I had just utterly destroyed my new aluminized coating.

What to do. I could have returned it to good Mr. Fies and ask him to try again. But that would have been just too embarrassing to explain. Also, since I’m apparently bound to make everybody else rich, I should spread the wealth among as many people as possible. So this time I sent it to Optical Wave Laboratories, or OWL. The price and shipping were somewhat greater, but who cares now? For what I’ve spent so far, I could have bought a brand new scope. But I’m still in love. I still have high hopes.

It took over a month for the mirrors to arrive. I have them reinstalled. I have re-collimated. I’m waiting for the sky to clear. I’ll try again.
Congratulations to
Laurie Allai

Horsehead and Flame Nebula Ha+RGB

OTA: Celestron Edge 11 F/2 Hyperstar
Mount: Celestron CGX
Camera: Canon T2i, modified by Hap Griffin, Baader H-alpha filter
Guided by: Stellarvue SV60EDS and Starshoot Autoguider, PHD2.6
33 frames of 360 Sec at ISO800 with H-Alpha filter
44 frames of 300 Sec at ISO400 with IDAS D1 filter
Captured with Images Plus Camera Control 6.0
Processed with Images Plus 6.5, Photoshop CS6.1
Members' Gallery

by Robert Pettengill
Austin City Lights Pleiades
Taken from NW Austin under a Bortle 6+ sky with a 2" telescope, 38 degrees away from a 55% illuminated moon. William Optics 250/52 mm Petzval refractor, Sony a7iii, and Vixen Polaris portable mount. Total exposure of 90 minutes in 30" exposures at ISO 3200. Stacked in Nebulosity, final crop and exposure in Photoshop. Details and a comparison with earlier efforts at: http://BadAstroPhotos.com/blog200203.html

by Rathijit Banerjee
The Heart Nebula, shot in SHO color palette
Imaging telescope: Stellarvue SVR102T with 0.8x Reducer
camera: ZWO ASI1600MM-P | Mount: Astro-Physics 1100GTO-AE
Astrodon Ha 36mm 5nm (10 hours)
Astrodon Oiii 36mm 3nm (10 hours)
Astrodon SII 36mm 3nm (10 hours)
Total Integration time: 30 hours
Processed in AstroPixel Processor and Photoshop CS.

by Tyler Curtis
Messier 78 - Casper the Friendly Ghost Nebula
Taken near Llano, TX | 10x5 minute exposures | Processed in DSS and Photoshop

by Tom Richter
Atlas-Centaur 2
The upper stage of Atlas-Centaur 2 fades into the earth's shadow.
Photo taken Jan 23, 2020 via iPhone7. Launched in November 1963, this was the first Centaur upper stage to achieve orbit, the first liquid hydrogen fueled vehicle to achieve orbit, and is the direct ancestor of the Centaur upper stages still in use on the current Atlas V launch vehicle. This particular stage is quite bright as seen from earth and must be the brightest of the early satellites still in orbit. On this pass it
by Stephen Hill
*
**The Pleiades, aka M45**

DSLR, a 300mm lens, a 1.4x teleconverter, CLS filter, camera mount, guided in RA only.
Stacked 50 exposures of 80 seconds each, f5.6, ISO 1600. 16 darks, 16 flats, and 16 bias frames.

by Tom Campbell

**M81 & M82**

LRGB image 960 seconds each RGB, 3600 seconds Luminosity. Combined in AstroPixelProcessor, finished in Photoshop CC. ZenithStar 61, ZWOasi183mm.

by Tom Campbell

**IC443**

IC443 supernova remnant: combined image in H alpha and Oiii. 15 each 300 second subs, ZenithStar 61, ZWO 183mm from my backyard.

by Chris Foster

**Orion/RunningMan is NBLRGB**

This is the final blending of my two panel mosaic combining both Narrowband data with the LRGB data. I took this 7-filter data set in 42 sessions over a two year period. I used HDR processing for all the channels due to the high dynamic range of the target. The only noise reduction was MUREDenoise. This image had 40.75 hours of LRGB and Narrowband data per panel.
This is my first try at M1. I chose to do narrowband, but SHO Hubble palette has very psychedelic colors! I am trying different combinations to play with the color palette, but I like the SHO.

The Crab Nebula (M1, NGC 1952, Taurus A) is a supernova remnant in the constellation of Taurus. Corresponding to a bright supernova recorded by Chinese astronomers in 1054, the nebula was observed later by English astronomer John Bevis in 1731. The nebula was the first astronomical object identified with a historical supernova explosion.

At an apparent magnitude of 8.4, comparable to that of Saturn’s moon Titan, it is not visible to the naked eye but can be made out using binoculars under favorable conditions. The nebula lies in the Perseus Arm of the Milky Way galaxy, at a distance of about 2.0 kiloparsecs (6,500 ly) from Earth. It has a diameter of 3.4 parsecs (11 ly), corresponding to an apparent diameter of some 7 arcminutes, and is expanding at a rate of about 1,500 kilometres per second (930 mi/s), or 0.5% of the speed of light.

At the center of the nebula lies the Crab Pulsar, a neutron star 28–30 kilometres (17–19 mi) across with a spin rate of 30.2 times per second, which emits pulses of radiation from gamma rays to radio waves. At X-ray and gamma ray energies above 30 keV, the Crab Nebula is generally the brightest persistent source in the sky, with measured flux extending to above 10 TeV.

Imaging telescope or lens: Meade LX200 10” f/10
Imaging camera: ZWO ASI1600MM-PRO
Mount: ORION HDX-110 EG-G
Guiding telescope or lens: Celestron OAG
Guiding camera: ZWO ASI290mm Mini
Focal reducer: AstroPhysics F/8 Reducer
Software: PHD Labs PHD 2 Guiding, Carte Du Ciel 3.10, Sequence generator pro
Astromomik SII 36mm: 60x300” (gain: 200.00) -15C
Astromomik H-Alpha 36mm 6nm: 60x300” (gain: 200.00) -15C
Astromomik OIII 36mm 6nm: 60x300” (gain: 200.00) -15C
Integration: 15.0 hours

Processed in LsRGB color Pallet

Processed in LHSO color Pallet
Treasurer's Report 1/30/2020

Checking Account

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1/30/2020 Balances

- Checking Account  $9,713.70
- Donations Account $2,199.87
- CD No.1  $5,943.55
- CD No.2  $5,908.74
- Scholarship Account $2,60
- PayPal  $759.53

**TOTAL**  $24,527.99
EC Minutes November 2019
By Terry Phillips, Secretary

Attending: Jim Spigelmire, Brian Lippincott, Joyce Lynch, Mike Marotta, Greg Rohde, Terry Phillips, Tim Brown, Domingo Rochin, Dawn Davies, Bill Gammerdinger

Call to order 7PM November 4th 2019. President Jim Spigelmire presiding.
Minutes of the previous EC meeting, 7th October were approved.

Treasurer
• Jim reported John Cassidy’s finding on equipment insurance. Best deal on $57,858 policy was with a $1,157 premium which is slightly over original $1K budget.
• Motion was made and approved to pay the slight overbudget premium.

Equipment – Brian
• reported on discussions with Domingo R, and Alan C for placing a storage shed at Bad Wolf Ranch (BWR) observing site.
• Working with Alan and Greg on providing 600 gallons of potable water storage at the site.
• Jim asked for a 1 year plan for BWR operation and improvements.

Joyce – Outreach
• AUTS was relatively lightly attended. Estimated 75 attendees, a dozen scopes on the field. Attendance due to unusual time in the year with lots of competition with other events and light publicity for the event. Observing conditions were about as good as it gets for St. Stephen’s. Awarded give away scope for AUTS. Joyce to get with Terry on delivery and support.
• Discussed plans for Dec 14th start party at Pedernales Falls State Park. Expecting a large crowd.
• Still finalizing 2020 observing calendar for Pedernales. Rangers are requesting the dates and mentioned they would like 12 parties / year. AAS has committed to 10 / year with no makeups required for bad weather.
• Also still need to get back to Inks Lake State Park on their observing dates. Discussed our desired level of commitment to Inks.

Tim – Member Services
• No Practical Astronomy session available for November meeting.
• Planning for 6 practical sessions and/or Mansfield Dam excursions for 2020.
• Dawn to be the main presenter for the January meeting to Present on Astronomical League and ALCOR.
• Dawn recommended we consider adding an ALCor segment to our monthly meetings to cover list of recommended observing objects for the month. Unanimously agreed.
EC Minutes Continued

- Dawn will be updating austinastro.org pages on AL / ALCor
- Discussion on who would communicate AAS Roster to ALCor
  - Discussion on more timely posting of presenter and meeting blurb on the website, and enabling auto-next-event-scroll-to-the-top feature on the site.
  - Dawn to get with Tim on lining up spring speakers.
  - Tim to work with Alan about not publishing detailed location coordinates of BWR to general public.

**Greg, Brian – CONEX storage for PFSP**
- Reviewed the latest specs and installation plans for the CONEX storage unit at Pedernales Falls.
- Greg authorized to pull the trigger on ordering the CONEX.
- Agreed to keep the unit on Brian’s property if PFSP was not ready to receive it.

**Mike Marotta – MAL**
- Suggested fonts and layout format for EC and GA minutes.
- Discussed AL Reflector article How to Grow Your Club and how it’s ideas could be leveraged.
- Discussed inexpensive telescopes and possibility of multiple scope give-away to generate interest in new memberships

**Bill Gammerdinger – New member**
- Planning to observe Mercury transit at BWR
- Would like to publicize to bring more members out for the transit.

**Old Business**
- John C has escalated memo of agreement with PFSP
- Jim has reached out to Austin High on possibility to hold meetings on their campus, but any previous enthusiasm on their part seems to have waned. Not sparking interest currently
- Christmas party all set to go at Austin Gem and Mineral Dec 13th.

Meeting was adjourned at 9:15 PM
Call to order: 7:30 pm at UT campus, ETC II 2.136
President Jim Spigelmire presiding
Quorum was met.
A motion to approve September GA minutes was made and approved.

Tim Brown welcomed new members and guests.

Jim discussed office vacancies for VP, 2 Members at Large, and Communications Chair. Reported for John C. current bank balance at $35K.

**Brian Lippincott (Equipment)**: presented status of the shipping container storage unit (CONEX) for Pedernales Falls State Park. CONEX is ordered and being built out to our specs. The unit will be stored temporarily on Brian's property if PFSP is not ready to receive it.

**Joyce Lynch (Outreach)**: Austin Under the Stars (AUTS) at St. Stephen's was a success though lightly attended. A dozen or more scopes were on the field. Observing conditions were better than usual for St. Stephen's. 4” Astro Blast DOB was awarded to nine-year-old Emma.

Volunteers needed for star party at Balcones Canyonlands National Wildlife Refuge 9th Nov.

Last PFSP star party drew crowd of 400. Next party 14th Dec expecting possibly larger crowded. PFSP rangers looking a ticketing process to limit attendance to manageable size

Joyce passed around a thank-you card for Frank Mikan for his help with AUTS.

**Tim Brown (Member Services)**: Announced next member’s star party at Bad Wolf Ranch for 23rd Nov. Also discussed protocol for members individual access to BWR on non-star party dates. We are implementing a check-in process on our website for visits to BWR.

**Dawn (AL Liaison)**:
Will provide AL Messier List preview for the star party on the 23rd.
Discussed upcoming Mercury Transit and the AL Transit Club. Discussed odds of living to see the next transit. Discussed possibility of inviting Firefly Aerospace in Cedar Park to present in the new year.

Brian presented What’s up in Astronomy segment.
Rob Pettengill presented on his 2019 ACEAP Expedition to Chile

Meeting adjourned at approximately 9:40
MEMBERSHIP CARDS NOW IN YOUR PROFILES

At last, Wild Apricot, our membership database vendor, has made available to its customers membership card templates. Now, under your AAS membership profile you will see a mockup of a card with your name, Membership ID and membership expiration date. You are offered two options for displaying your card: one which is suitable for displaying from a smartphone, and another printable PDF which you can cut and laminate to your heart’s delight.

NIGHT SKY NETWORK

The Night Sky Network is a nationwide coalition of amateur astronomy clubs bringing the science, technology, and inspiration of NASA’s missions to the general public. AAS members can register with NSN and receive the NSN newsletter and email about upcoming webinars and any additional information or announcements created by the NSN for members. They will be able to search for resources, view all of the toolkits and the files, and access the downloads in each kit.

If you are interested in registering, here is the procedure.

Go to [https://nightsky.jpl.nasa.gov/index.cfm](https://nightsky.jpl.nasa.gov/index.cfm)

Enter your zip code in the upper right box for CURRENT LOCATION.

Scroll down to CLUBS NEAR YOU and click on AAS.

Click on Register in the toolbar on our page.

Fill out the form and submit.

Your form will be sent to the club for approval.

If you have any questions, email outreach@austinastro.org
JOINING AAS OR RENEWING MEMBERSHIP

To join or renew your membership to AAS, please visit: http://austinastro.org/index.php/why-should-you-be-a-member/ There are six membership levels to choose from:

**Household Bundle (up to 6 members) $40.00 (USD)**
Renewal: Every one year, starting from join date
No recurring payments. For members of a household living at the same address.

**Household With Senior (up to 6 members) $28.00 (USD)**
Renewal: Every one year, starting from join date
No recurring payments.
For members of a household living at the same address and at least one member is over 65 years of age.

**Junior $15.00 (USD)**
Renewal: Every one year, starting from join date
No recurring payments. For members up to age 18.

**Students $15.00 (USD)**
Renewal: Every one year, starting from join date
No recurring payments. For members age 18 and older.

**Regular $25.00 (USD)**
Renewal: Every one year, starting from join date
No recurring payments. For individual members.

**Seniors $15.00 (USD)**
Renewal: Every one year, starting from join date
No recurring payments. For members 65 years of age or older.

Visit Dawn Davies' Earthbound Astronomer website at https://www.earthboundastronomer.com/


Rob Pettengill’s site can be found at http://astronomy.robpettengill.org/. Rob's material shared per CC BY-NC-SA 4.0 license.

Celestial Teapot's product catalog can be found at http://messierplanisphere.com/

Joseph Macry writes a weekly column for Manor Community News: “This Week in Astronomy”. You can read the online edition here: http://manorcommunitynews.com/
**Dark Sky Specialist Wanted**

Bill Wren let us know that a new Dark Skies position at University of Texas McDonald Observatory has been posted.

Follow this link for more information: